PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
ARP2383

TWIN–TRAY COMPACT DISC PLAYER

PD-Z75T

SD,
HPW

- **Refer to the service manual ARP2131 for PD–Z74T and PD–Z570T.**
- **This manual is applicable to SD and HPW types.**

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SG JAN. 1992 Printed in Japan

CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

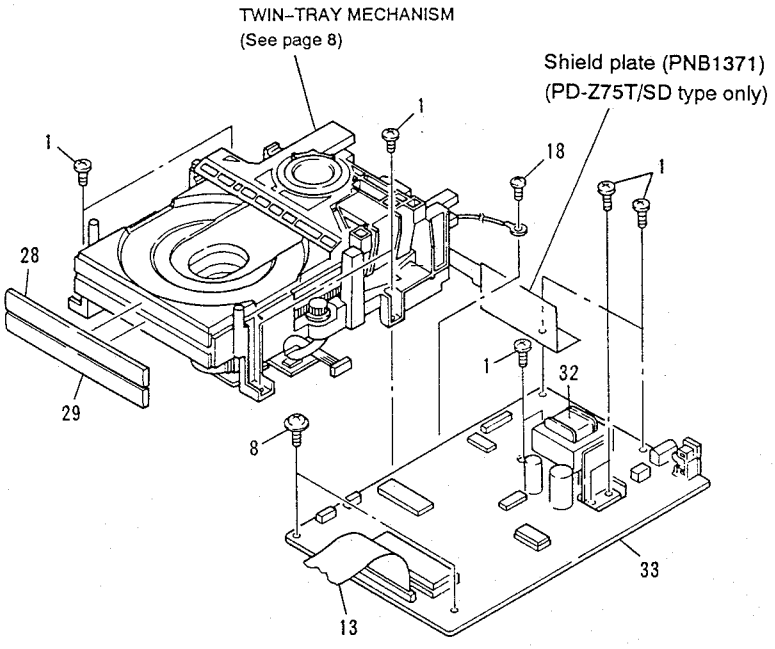
PD-Z75T/SD, HPW and PD-Z74T/HEM have the same construction except for the following:

Mark	Symbol & Description	Part No.			Remarks
		PD-Z74T/ HEM type	PD-Z75T/ SD type	PD-Z75T/ HPW type	
⊙	Mother board assembly	PWM1350	PWM1348	PWM1350	(No.33)
⚠	AC power cord	PDG1008	RDG1003	PDG1011	(No.17)
⚠	Power transformer (AC220/240V)	PTT1125	.....	PTT1125	(No.32)
⚠	Power transformer (AC110/120-127/220/240V)	.....	PTT1126	.....	(No.32)
⚠	Voltage selector (AC110/120-127/220/240V)	.....	PSB1002	.....	
	Function panel	PNW1865	PNW2072	PNW2072	(No.27)
	Window	PAM1450	PAM1559	PAN1559	(No.12)
⊙	Shield plate	.....	PNB1371	.....	
	Operating instructions (English/French/German/Italian/Dutch/ Spanish/Portuguese/Swedish)	PRE1136	.....	.....	(No.31)
	Operating instructions (English)	.....	PRB1157	PRB1157	(No.31)
	Operating instructions (Spanish)	.....	PRC1042	.....	
	Packing case	PHG1578	PHG1721	PHG1721	(No.22)

MOTHER BOARD ASSEMBLY (PWM1350)

Although PWM1348 and PWM1350 are different in part number, they have the same service parts.

- **Exploded views**



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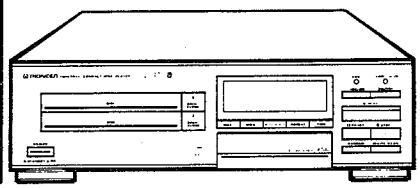

ORDER NO.
ARP2131

TWIN–TRAY COMPACT DISC PLAYER

PD-Z74T
PD-Z570T

MODEL PD–Z74T AND PD–Z570T HAVE FOLLOWING VERSIONS:

Type	Applicable model		Power requirement	Export destination
	PD–Z74T	PD–Z570T		
HEM	○	○	AC220V, 240V (switchable)*	European continent
HEMXJ	○	–	AC220V, 240V (switchable)*	European continent
HB	○	–	AC220V, 240V (switchable)*	United kingdom
HBXJ	○	–	AC220V, 240V (switchable)*	United kingdom
SD	○	○	AC110V, 120V–127V, 220V, 240V (switchable)	Kingdom of Saudi Arabia and general market
HPW	○	–	AC220V, 240V (switchable)*	Australia

* Change the position of the jumper of the mother board assembly.

- **This manual is applicable to the PD–Z74T/HEM, HEMXJ, HB, HBXJ, SD, HPW, PD–Z570T/HEM and SD types.**
- **As to the PD–Z74T/HEMXJ, HB, HBXJ, SD, HPW and PD–Z570T/SD types, refer to pages 73–79.**
- **PD–Z74T/HEMXJ and HBXJ types, manufactured in singapore, are identical with PD–Z74T/HEM and HB types respectively.**
  For identification, "MADE IN SINGAPORE" is shown on the rear panel of the product.
- **As to the mechanism description, refer to PD–Z74T SERVICE GUIDE ARP2144.**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

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1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn varoitusmerkki

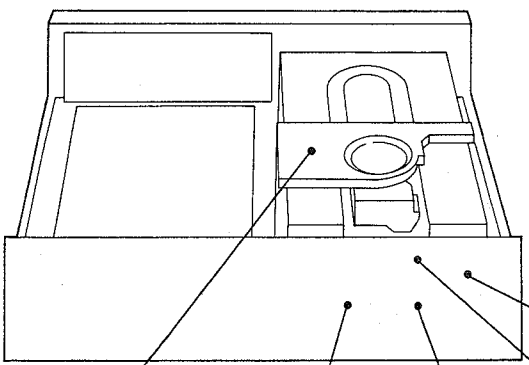
WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LASER
Picture 1
Warning sign for laser radiation

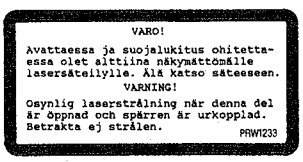
LABEL CHECK (TWIN type)



Additional Laser Caution

1. Laser Interlock Mechanism
The ON/OFF (ON : low level/OFF : high level) status of the U (S601) and L (S603) switches for detecting the disc clamp state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches U and L are OFF (high level).
Thus, the interlock will no longer function if switches U (S601) and L (S603) are deliberately shorted.
Laser diode oscillation will continue if pins 2 and 3 of CXA1471S (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).
2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

HEM, HEMXJ, HB and HBXJ types


VARO!
Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.
VARNING!
Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.
PRW1233

HEM and HEMXJ types

HEM, HEMXJ, HB and HBXJ types

ADVARSEL
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHED SAFBRYDERE ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT!
UNSICHTBARE LASER-STRAHLUNG TRITT AUS, WENN DECKEL (ODER KLAPPE) GEÖFFNET IST! NICHT DEM STRAHL AUSSETZEN!
VRW1094

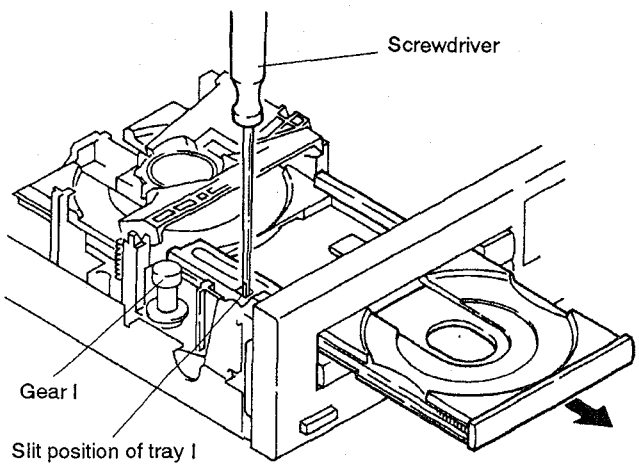
HEM and HEMXJ types

HB and HBXJ types

2. REMOVING AND MOUNTING OF EACH BLOCK

● REMOVAL OF TRAY I AND TRAY II

1. Open the tray I.
2. Insert the flat blade screwdriver into the slit in the left of tray I. Pull out the tray I by pushing the screwdriver.



* When remove the tray II, open it first, insert the flat blade screwdriver into the slit in the right of tray II, and pull out the tray by pushing the screwdriver.

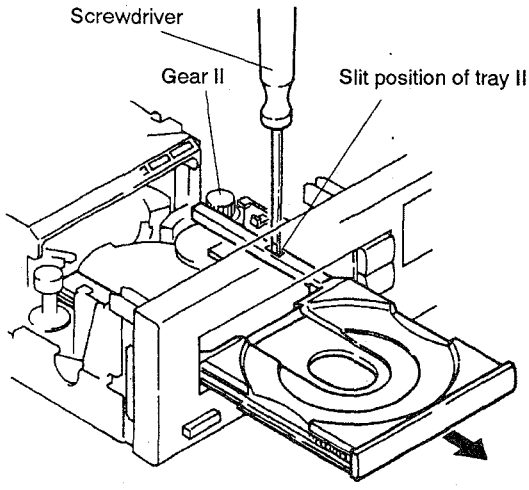


Fig. 1

● MOUNTING OF TRAY I

1. Set the disc II to the clamp position and open the tray I.
2. Align the 1st tooth of tray I to ungrooved portion of gear I, and insert the tray I.

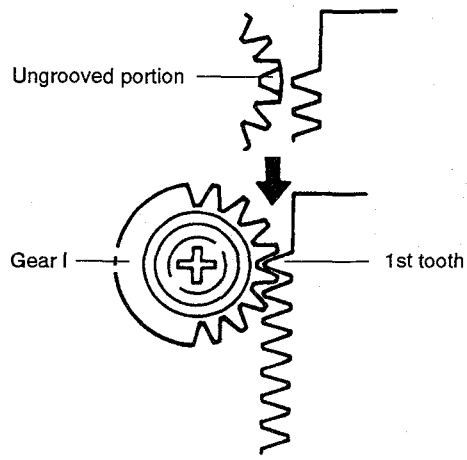


Fig. 2

● MOUNTING OF TRAY II

1. Set the disc I to the clamp position and open the tray II.
2. Align the 1st tooth of tray II to □ marked position of gear II, and insert the tray II.

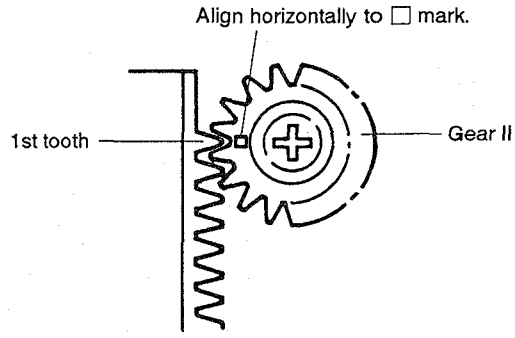


Fig. 3

● MOUNTING AND POSITIONING OF MAIN CAM, FOLLOW GEAR, GEAR I AND GEAR II

Set the following gears to the position as shown by arrows.

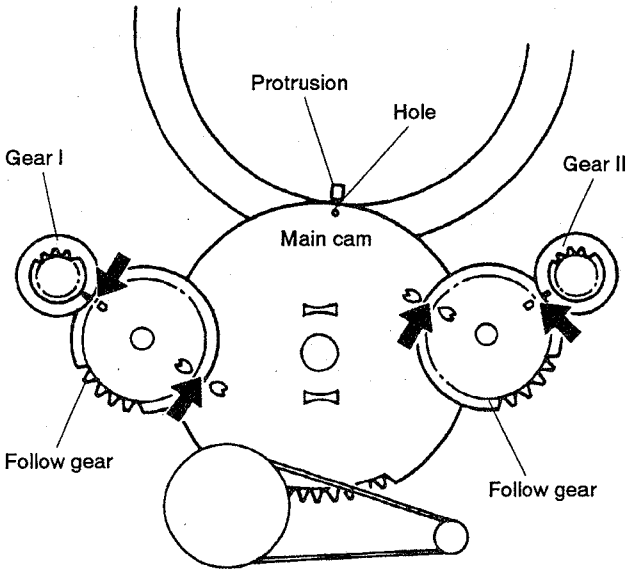


Fig. 4

● MOUNTING OF CLAMPER ASSEMBLY

Mount the clamper assembly by aligning the protrusion portion as shown in the figure.

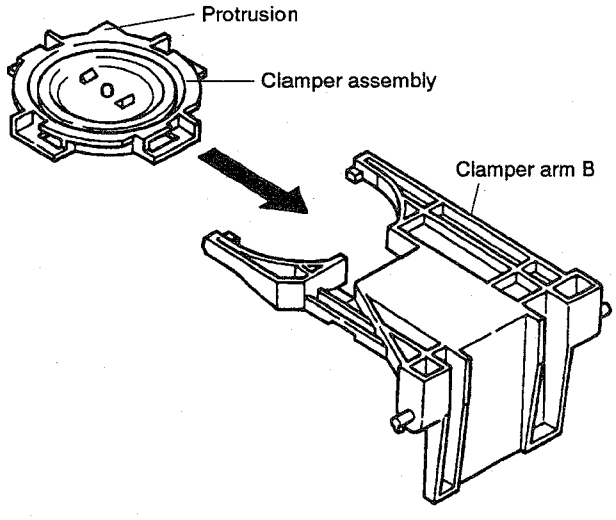
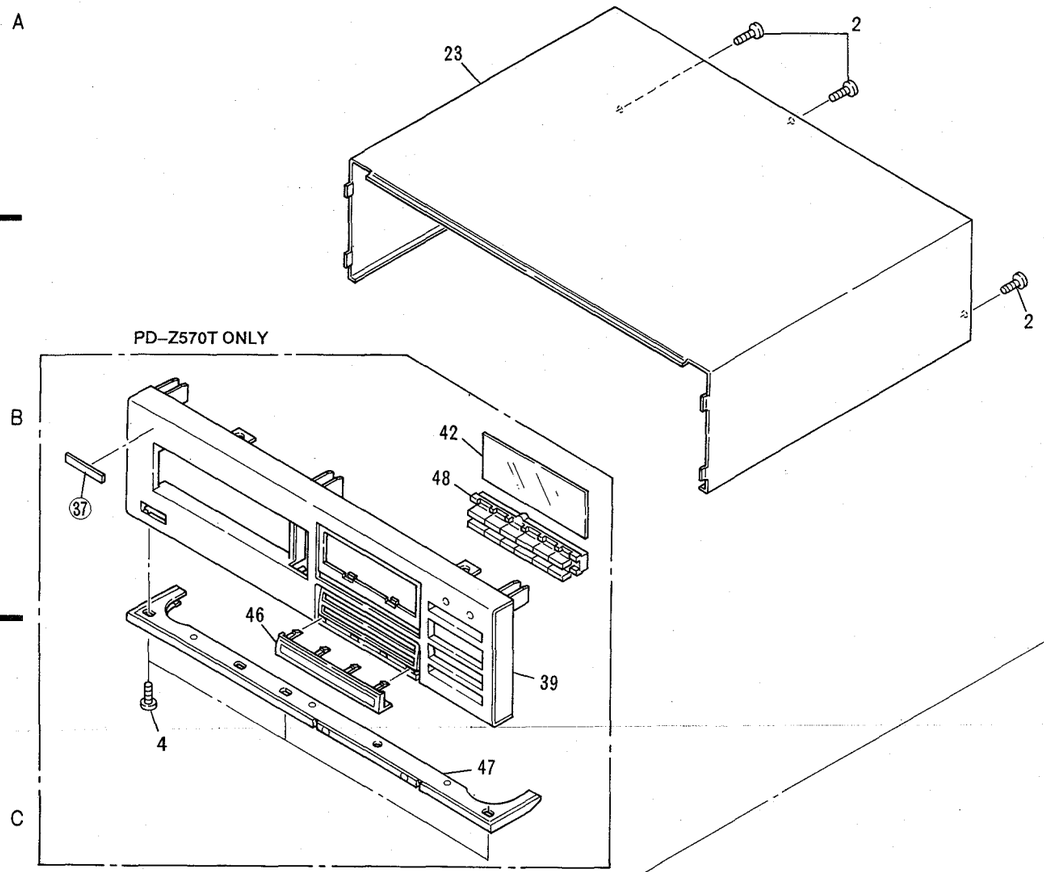
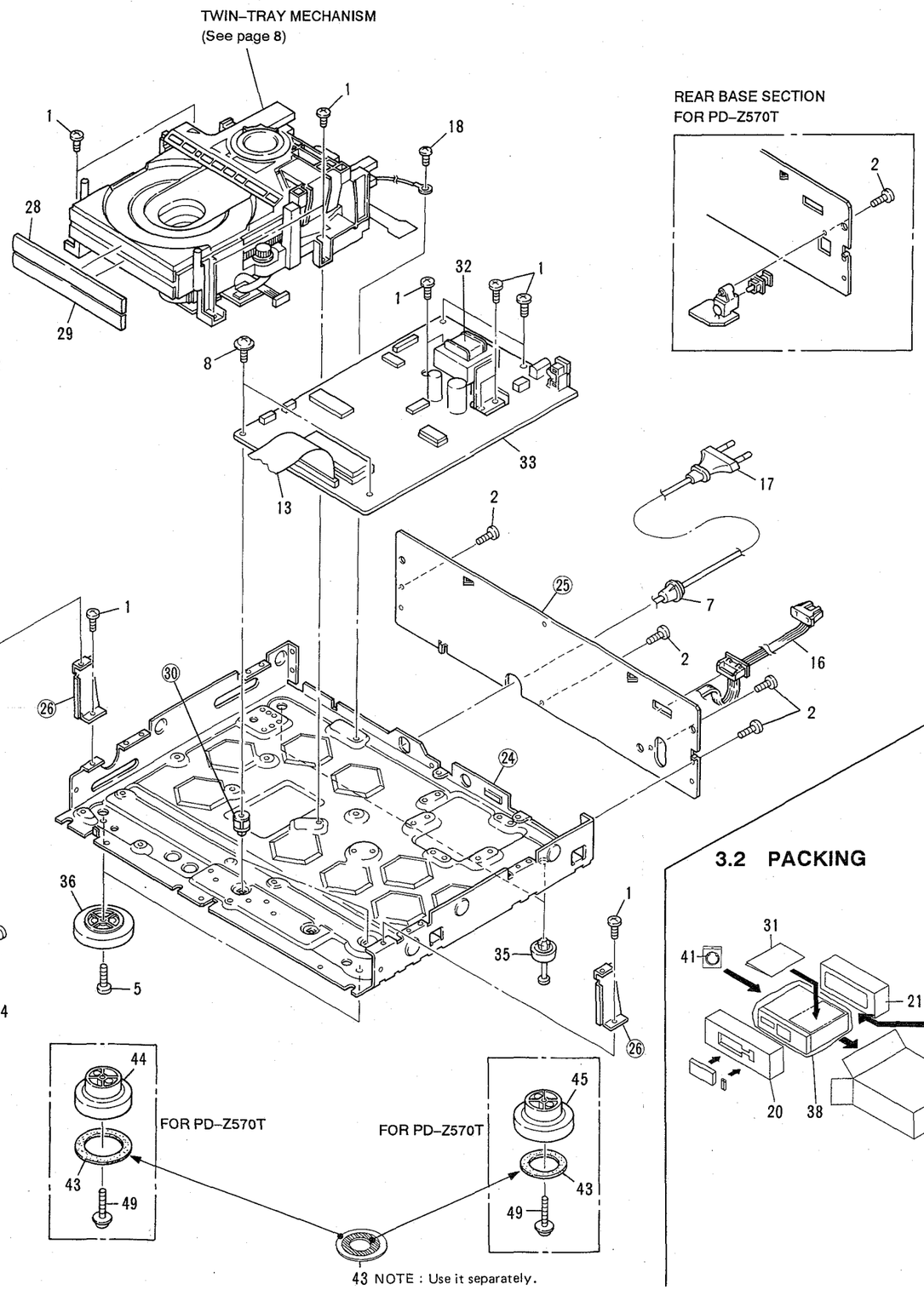


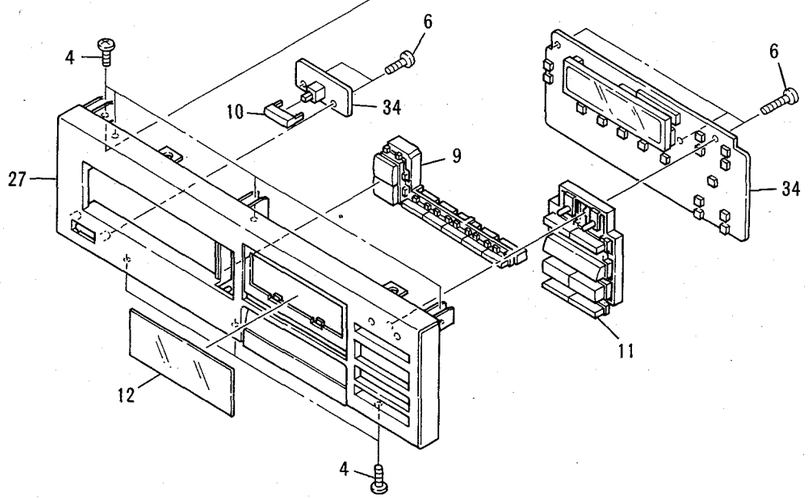
Fig. 5

3. EXPLODED VIEWS, PACKING AND PARTS LIST

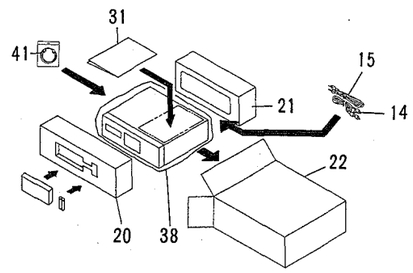
3.1 EXTERIOR



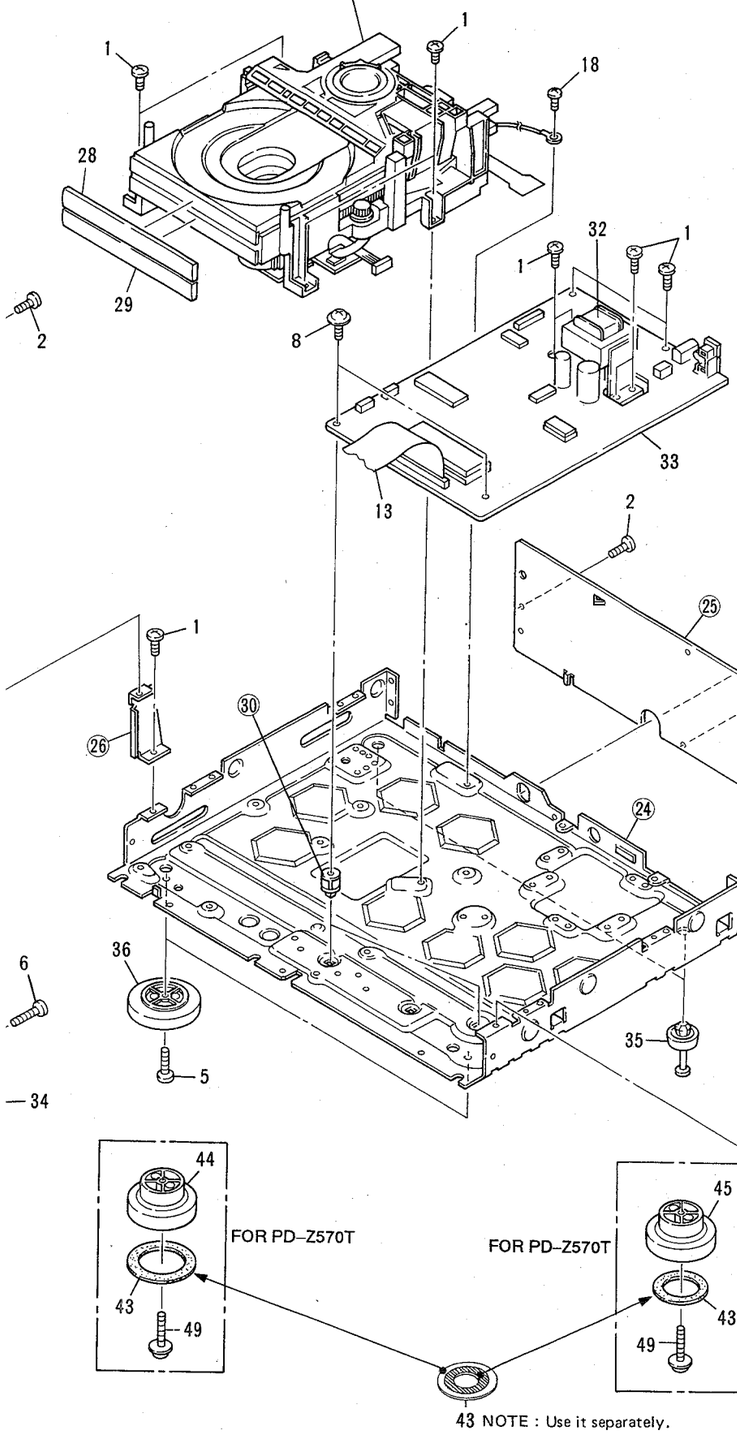




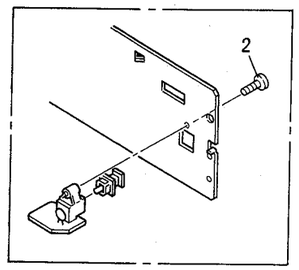
3.2 PACKING



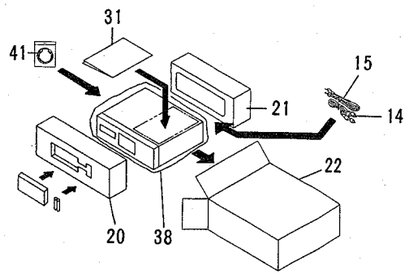
TWIN–TRAY MECHANISM
(See page 8)



REAR BASE SECTION
FOR PD–Z570T



3.2 PACKING



NOTES:

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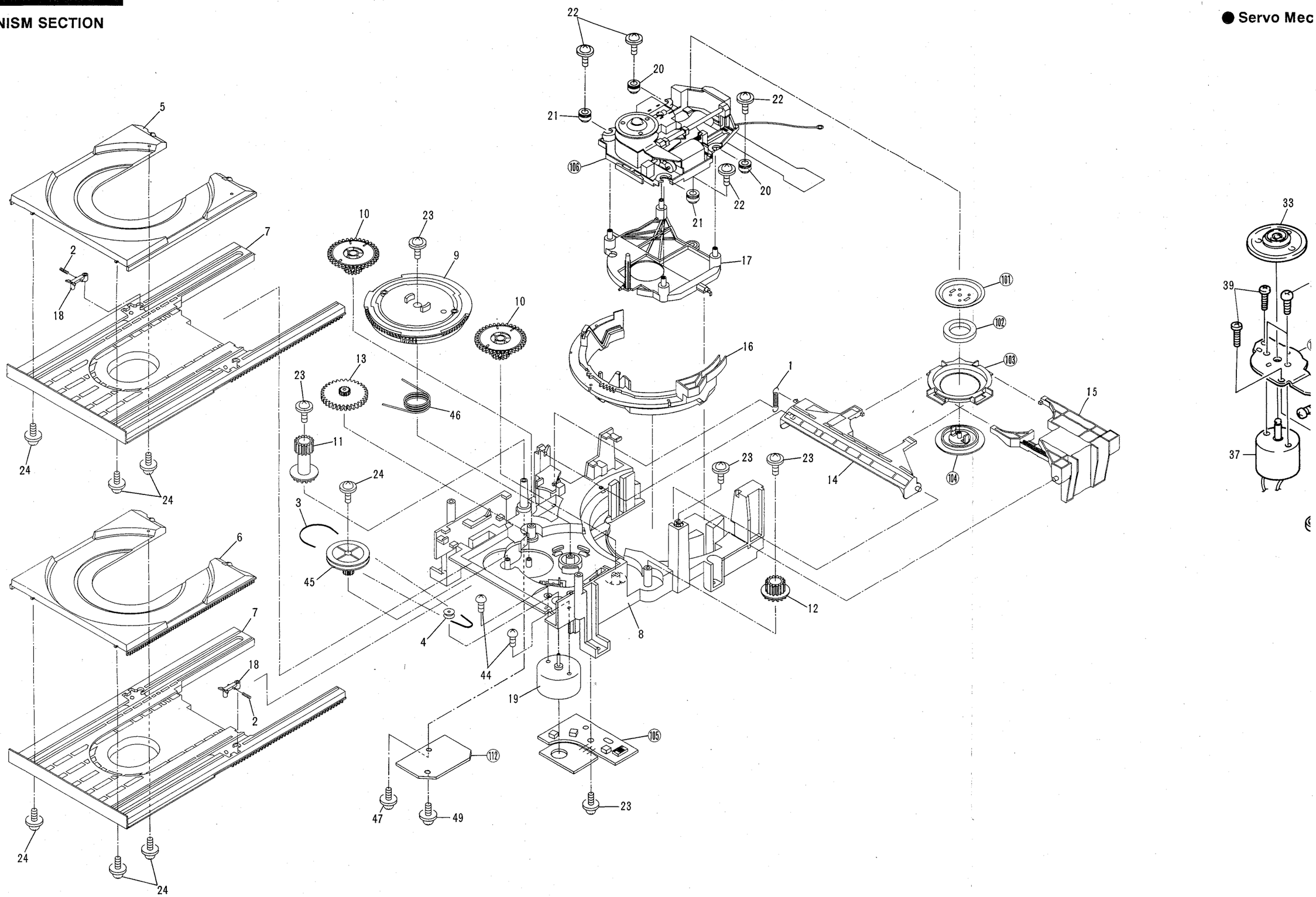
- The ⚠ mark found on some component parts indicates the impotance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

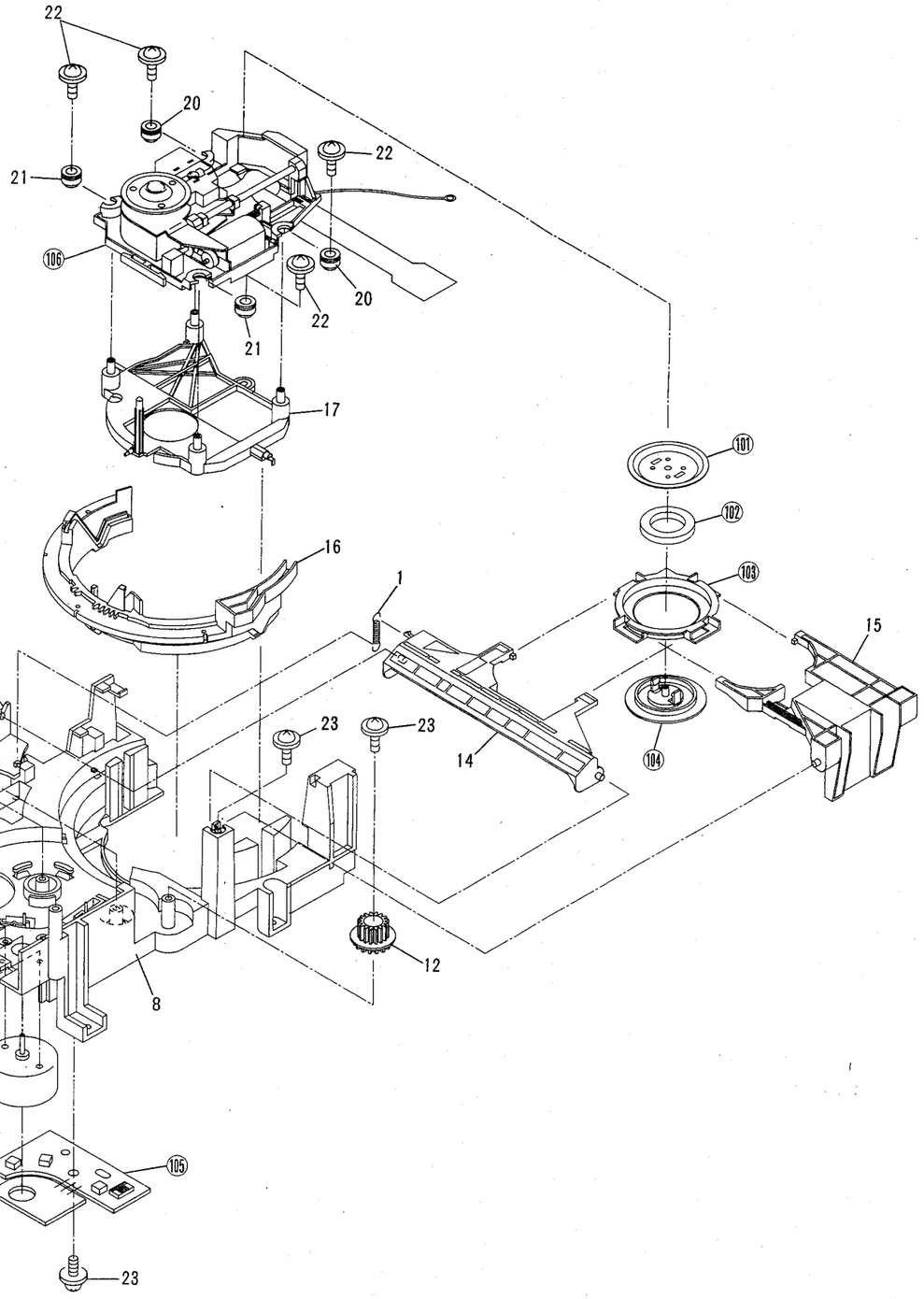
Parts List

Mark	No.	Symbol & Description	Part No.
	1	SCREW	BBZ30P060FMC
	2	SCREW	BBZ30P080FCC
	3	·····	
	4	SCREW	BBZ30P080FZK
	5	SCREW	BBZ30P100FMC
	6	SCREW	BBZ30P120FMC
⚠	7	STRAIN RELIEF	CM – 22B
	8	SCREW	IBZ30P150FMC
	9	DISC BUTTON (For PD – Z74T)	PAC1522
		DISC BUTTON (For PD – Z570T)	PAC1525
	10	POWER BUTTON (For PD – Z74T)	PAC1523
		POWER BUTTON (For PD – Z570T)	PAC1526
	11	PLAY BUTTON (For PD – Z74T)	PAC1524
		PLAY BUTTON (For PD – Z570T)	PAC1528
	12	WINDOW (For PD – Z74T)	PAM1450
		WINDOW (For PD – Z570T)	PAM1451
	13	30P F • F • C/30V	PDD1049
	14	CORD WITH MINI PLUG (For PD – Z74T)	PDE – 319
	15	CORD WITH PIN PLUG (For PD – Z74T)	PDE1065
	16	CORD WITH CONNECTOR (For PD – Z74T)	PDE1067
		CORD WITH CONNECTOR (For PD – Z570T)	PDE1114
	17	AC POWER CORD	PDG1008
	18	SCREW	PDZ30P050FMC
	19	·····	
	20	PROTECTOR F (For PD – Z74T)	PHA1141
		PROTECTOR F (For PD – Z570T)	PHA1143
	21	PROTECTOR R (For PD – Z74T)	PHA1142
		PROTECTOR R (For PD – Z570T)	PHA1144
	22	PACKING CASE (For PD – Z74T)	PHG1578
		PACKING CASE (For PD – Z570T)	PHG1579
	23	BONNET CASE	PYY1146
	24	UNDER BASE	
	25	REAR BASE	
	26	ANGLE	
	27	FUNCTION PANEL	PNW1865
	28	TRAY NAME PLATE 1 (For PD – Z74T)	PNW1866
		TRAY NAME PLATE 1 (For PD – Z570T)	PNW1874
	29	TRAY NAME PLATE 2 (For PD – Z570T)	PNW1867
		TRAY NAME PLATE 2	PNW1875
	30	PCB SPACER	
	31	INSTRUCTION MANUAL (For PD – Z74T)	PRE1136
		INSTRUCTION MANUAL (For PD – Z570T)	PRE1139
⚠	32	POWER TRANSFOMER	PTT1125
⊙	33	MOTHER BOARD ASS'Y (For PD – Z74T)	PWM1350
⊙		MOTHER BOARD ASS'Y (For PD – Z570T)	PWM1345
⊙	34	SUB BOARD ASS'Y (For PD – Z74T)	PWX1142
⊙		SUB BOARD ASS'Y (For PD – Z570T)	PWX1141
	35	FOOT ASS'Y (For PD – Z74T)	PXA1201
	36	INSULATOR ASS'Y (For PD – Z74T)	PXA1343
	37	PIONEER BADGE	
	38	SHEET	Z23 – 022
	39	FUNCTION PANEL ASS'Y (For PD – Z570T)	PEA1129
	40	·····	
	41	OPTICAL FIBER CABLE (For PD – Z570T)	AKX1031
	42	FL PLATE (For PD – Z570T)	PAM1452
	43	STOPPER (For PD – Z570T)	PNM1070
	44	INSULATOR (For PD – Z570T)	PNW1573
	45	INSULATOR (For PD – Z570T)	PNW1574
	46	PANEL NAME PLATE (For PD – Z570T)	PNW1876
	47	SUB PANEL (For PD – Z570T)	PNW1877
	48	TRACK BUTTON (For PD – Z570T)	PAC1527
	49	SCREW	IBZ30P200FMC

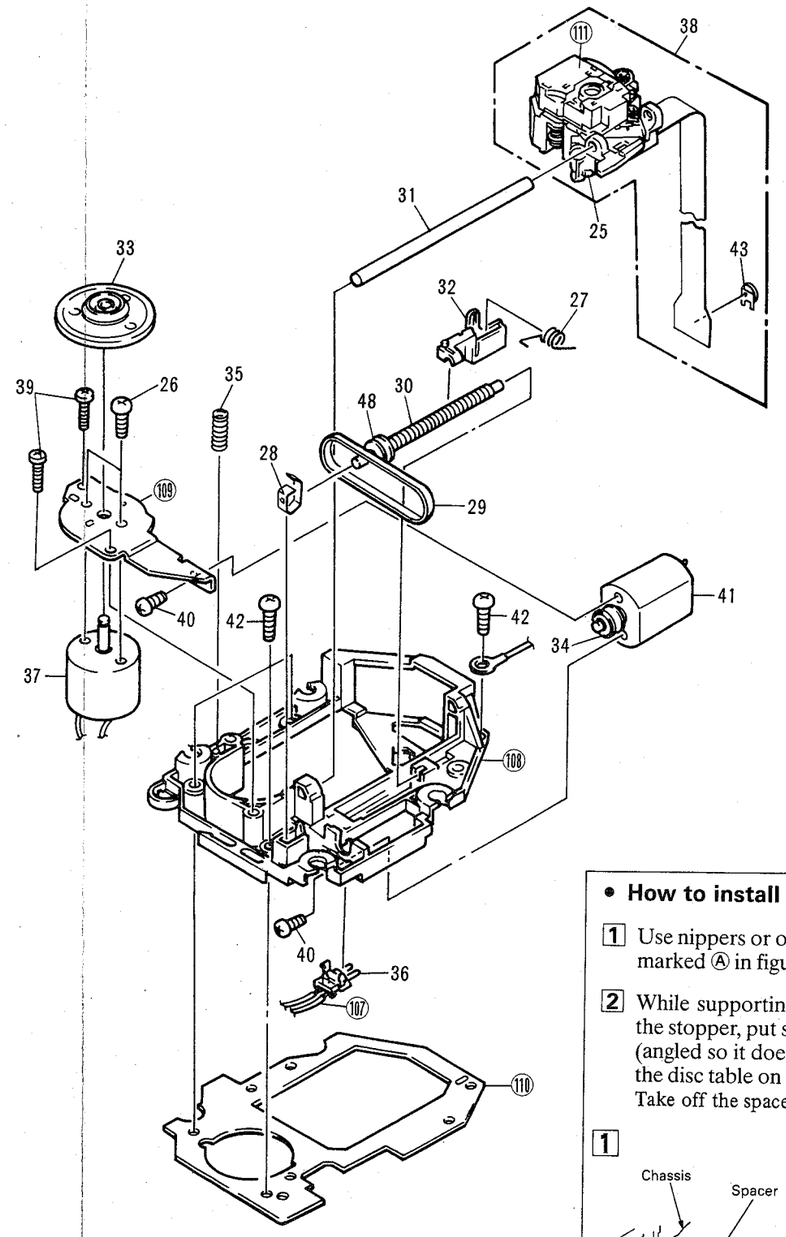
3.3 MECHANISM SECTION

● Servo Mec





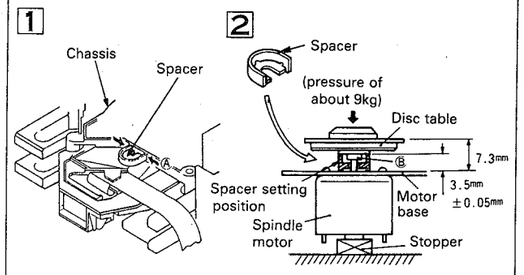
● Servo Mechanism Assembly Section



• How to install the disc table

1 Use nippers or other tool to cut the two sections marked Ⓐ in figure 1. Then remove the spacer.

2 While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section Ⓑ), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



Parts List of Mechanism Section

Mark	No.	Symbol & Description	Part No.
	1	Clamp spring	PBH1103
	2	Lever spring	PBH1104
	3	Belt	PEB1106
	4	Motor pulley	PNW1634
	5	Tray 1	PNW1839
	6	Tray 2	PNW1840
	7	Sub tray	PNW1841
	8	Loading base	PNW1842
	9	Main cam	PNW1843
	10	Follow gear	PNW1844
	11	Gear 1	PNW1845
	12	Gear 2	PNW1846
	13	Idler gear	PNW1847
	14	Clamper arm U	PNW1850
	15	Clamper arm B	PNW1851
	16	Clamp cam	PNW1852
	17	Float base	PNW1853
	18	Lock lever	PNW1854
	19	Motor (LOADING)	PXM1010
	20	Floating rubber	PEB1014
	21	Floating rubber	PEB1132
	22	Screw	PBA1048
	23	Screw	IPZ30P080FMC
	24	Screw	IPZ20P080FMC
	25	Chip capacitor	CKSYF105Z16
	26	Screw	JFZ20P025FMC
	27	Drive spring	PBH1084
	28	Plate spring	PBK1057
	29	Belt	PEB1072
	30	Drive screw	PLA1003
	31	Guide bar	PLA1071
	32	Half nut	PNW1605
	33	Disc table	PNW1608
	34	Pulley	PNW1634
	35	Earth spring	PBH1009
	36	Push switch	DSG1014
	37	Spindle motor assembly (with oil)	PEA1028
	38	Pick – up assembly	PEA1030
	39	Screw	BPZ20P080FZK
	40	Screw	PMZ20P030FMC
	41	Motor (CARRIAGE)	PXM1013
	42	Screw	PBZ30P080FMC
	43	Semi – fixed resistor	PCP1008
	44	Screw	PMZ26P040FMC
	45	Gear pulley	PNW1848
	46	Push spring	PBH1105
	47	Screw	IPZ30P200FMC
	48	Pulley	PNW1066
	49	Screw	IBZ30P120FMC

Mark	No.	Symbol & Description	Part No.
	101	Yoke	
	102	Magnet	
	103	Clamper holder	
	104	Clamper S	
	105	Mechanism P.C.B assembly	
	106	Servo mechanism assembly	
	107	Connector assembly (6P)	
	108	Mechanism chassis	
	109	Motor base	
	110	Mechanism base	
	111	Actuater cover	
	112	Sub plate	

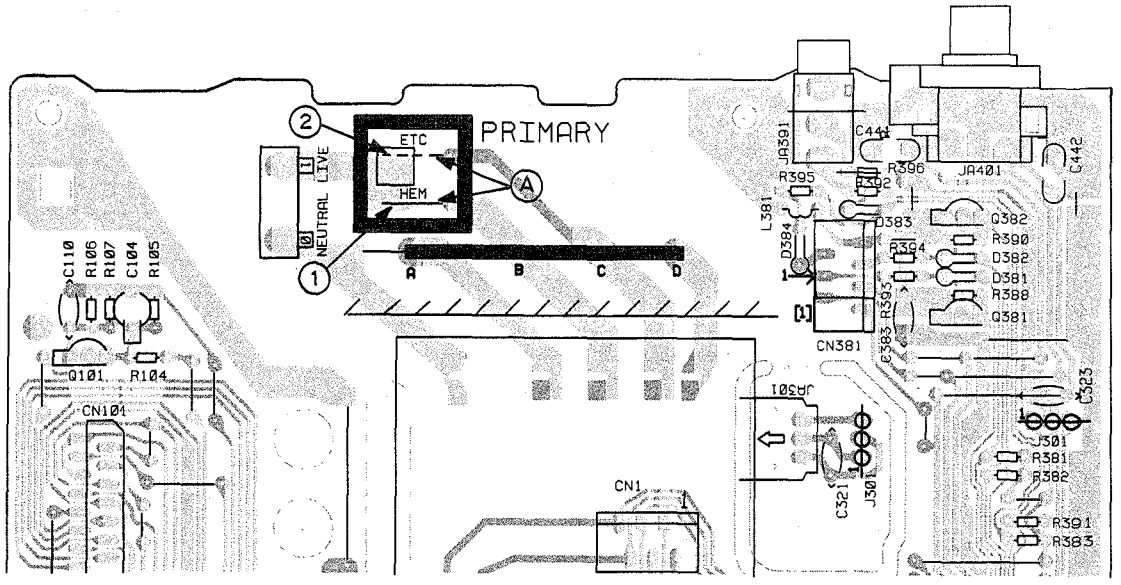
4. LINE VOLTAGE SELECTION FOR HEM, HEMXJ, HB, HPW AND HBXJ TYPES

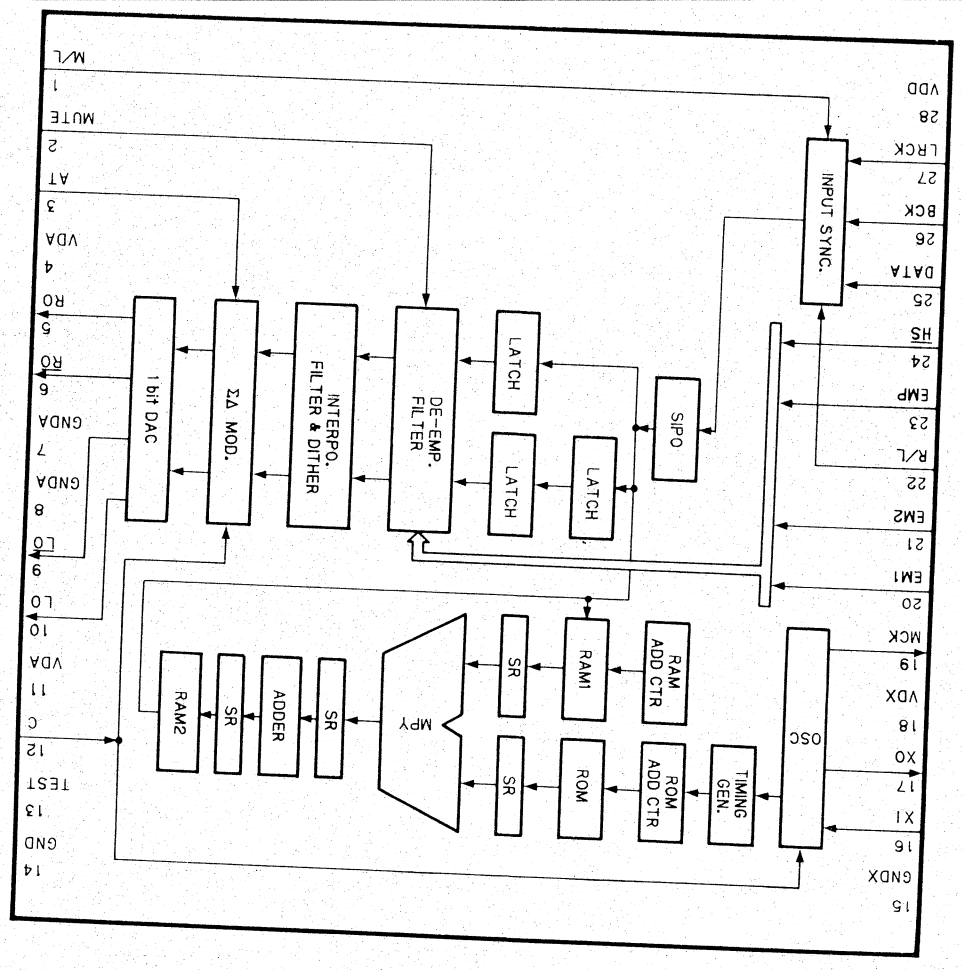
1. Disconnect the AC power cord.
2. Remove the bonnet.
3. Change the position of the jumper Ⓐ as follows.

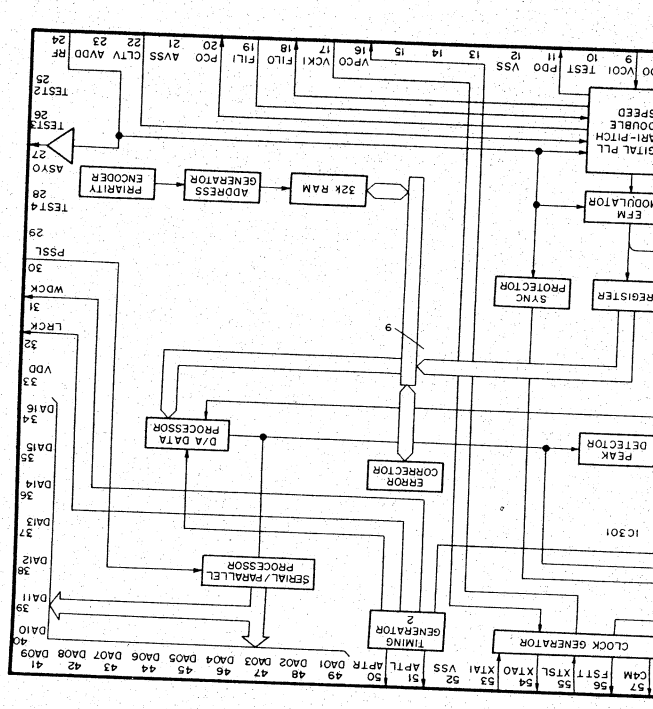
Voltage	Jumper Ⓐ position
220V	①
240V	②

4. Stick the line voltage label on the rear panel.

Description	Part No.
220V label	AAX-193
240V label	AAX-192







5. SCHEMATIC DIAGRAM

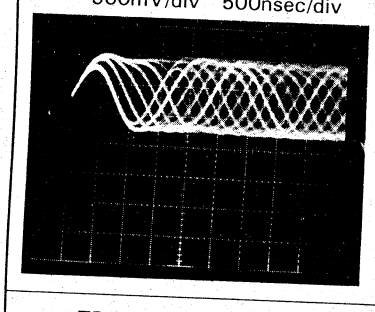
5.1 WAVEFORMS

Note: The encircled numbers denote measuring points in the schematic diagram.

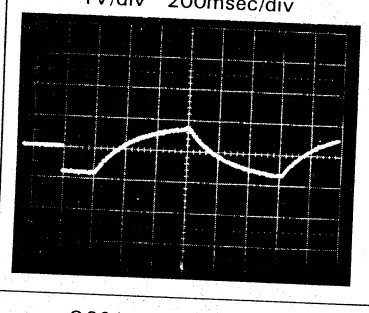
*1 50T-JUMP: After switching to the pause mode, press the manual search key.

*2 FOCUS-IN: Press the key without loading a disc.

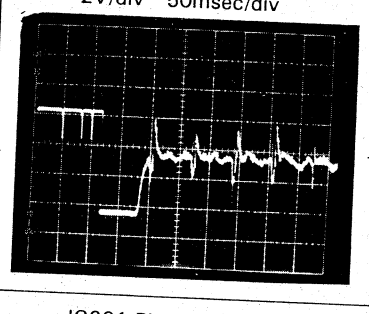
(2) TP1-Pin 1: PLAY MODE
(RF)
500mV/div 500nsec/div



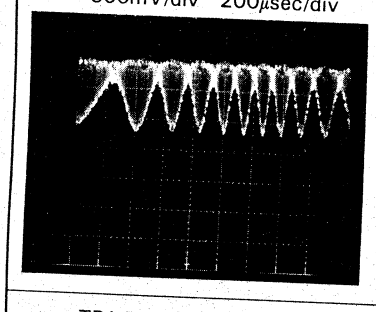
(5) Q201 Emitter: FOCUS-IN (*2) MODE
(FODR)
1V/div 200msec/div



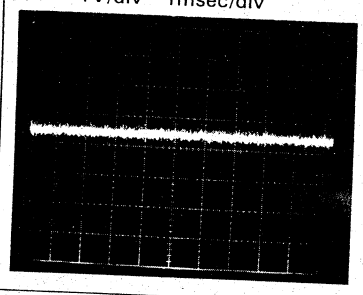
(7) IC201-Pin 9: TRACK SEARCH MODE
(SPDR)
2V/div 50msec/div



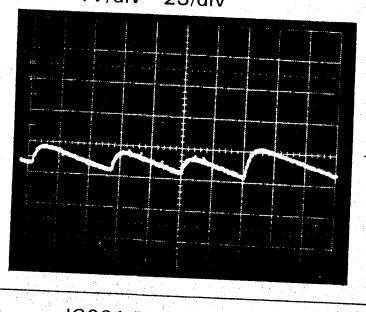
(2) TP1-Pin 1: TRACK SEARCH MODE
(RF)
500mV/div 200μsec/div



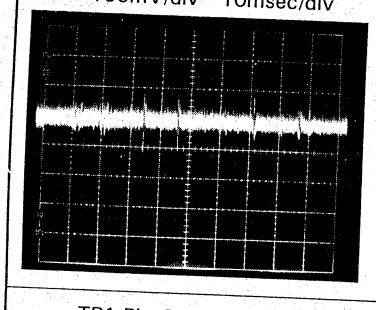
(5) Q201 Emitter: PLAY MODE
(FODR)
1V/div 1msec/div



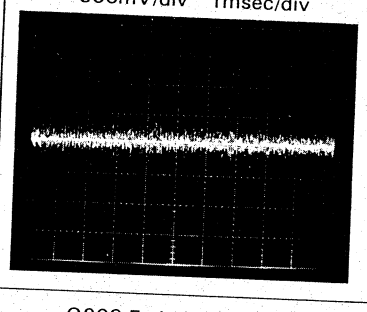
(8) IC201-Pin 3: PLAY MODE
(CADR)
1V/div 2S/div



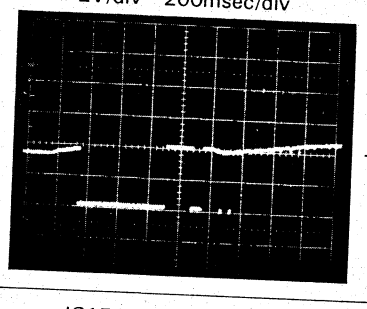
(3) TP1-Pin 6: PLAY MODE
(FOER)
100mV/div 10msec/div



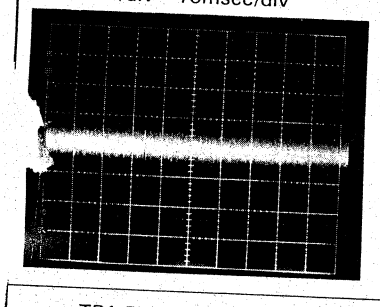
(6) Q203 Emitter: PLAY MODE
(TRDR)
500mV/div 1msec/div



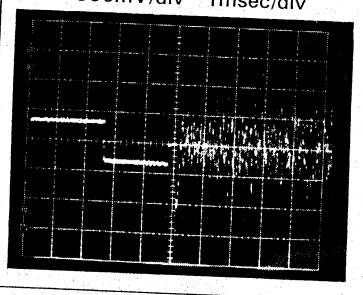
(8) IC201-Pin 3: TRACK SEARCH MODE
(CADR)
2V/div 200msec/div



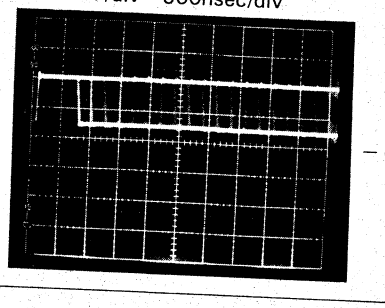
(4) TP1-Pin 2: PLAY MODE
(TRER)
1V/div 10msec/div



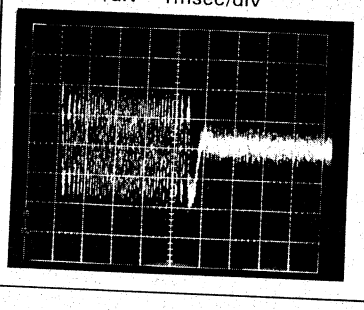
(6) Q203 Emitter: 50T-JUMP (*1) MODE
(TRDR)
500mV/div 1msec/div



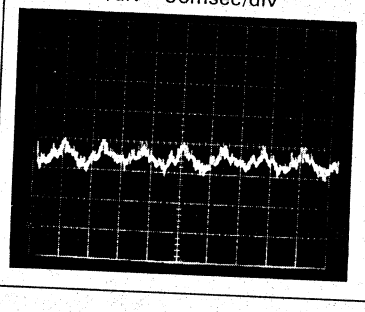
(9) IC151-Pin 38: PLAY MODE
(EFM)
2V/div 500nsec/div



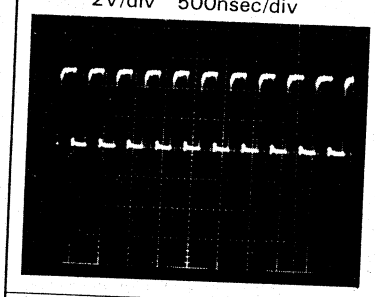
(4) TP1-Pin 2: 50T-JUMP (*1) MODE
(TRER)
1V/div 1msec/div



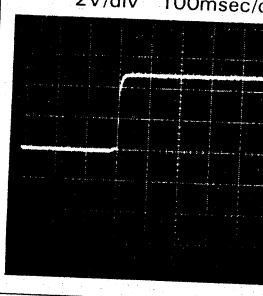
(7) IC201-Pin 9: PLAY MODE
(SPDR)
1V/div 50msec/div



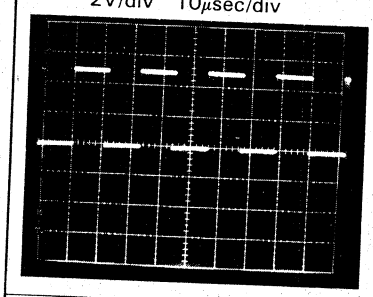
(16) IC301-Pin 35: PLAY MODE (1kHz)
(BCLK)
2V/div 500nsec/div



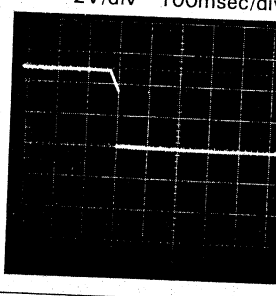
(22) IC20-Pin 9: POWER
(RST)
2V/div 100msec/d



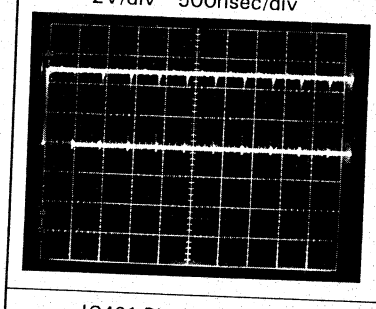
(18) IC301-Pin 32: PLAY MODE (1kHz)
(LRCK)
2V/div 10μsec/div



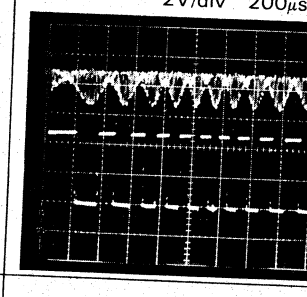
(22) IC20-Pin 9: POWER
(RST)
2V/div 100msec/div



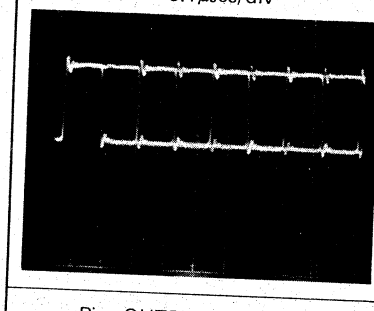
(19) IC301-Pin 34: PLAY MODE (1kHz)
(DATA)
2V/div 500nsec/div



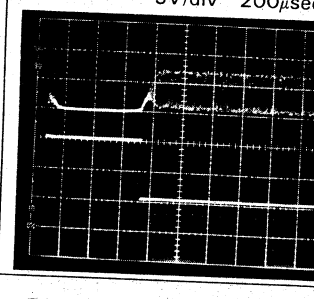
(23) : TRACK SE
Upper: TP1-Pin 1 (RF)
Lower: IC151-Pin 35 (
2V/div 200μs



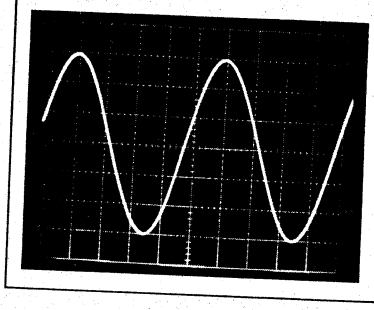
(20) IC401-Pin 9, Pin 10:
PLAY MODE (1kHz) (D/A OUT)
2V/div 0.1μsec/div



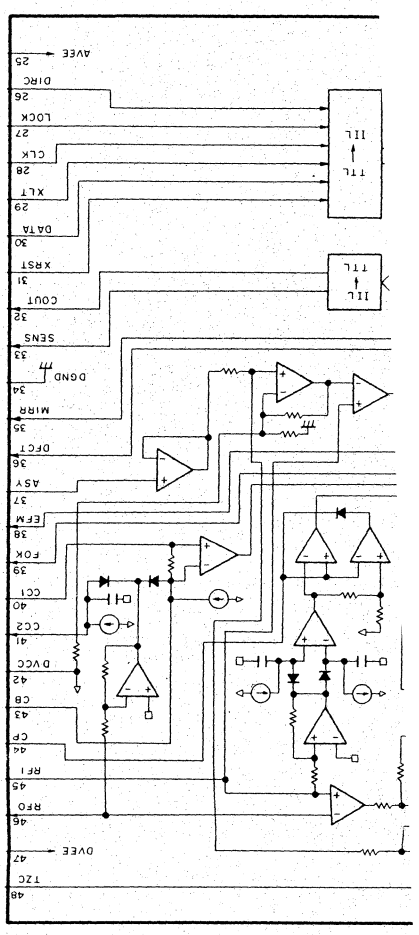
(24) : PLAY MOD
Upper: TP1-Pin 1 (RF)
Lower: IC151-Pin 36 (D
5V/div 200μse



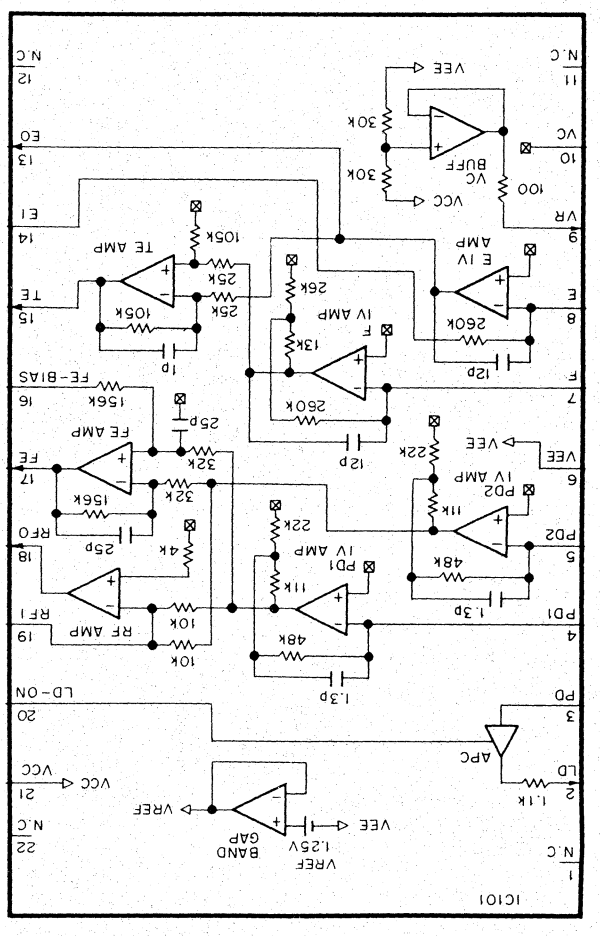
(21) Pin -OUTPUT: PLAY MODE (1kHz)
1V/div 200μsec/div



(25)

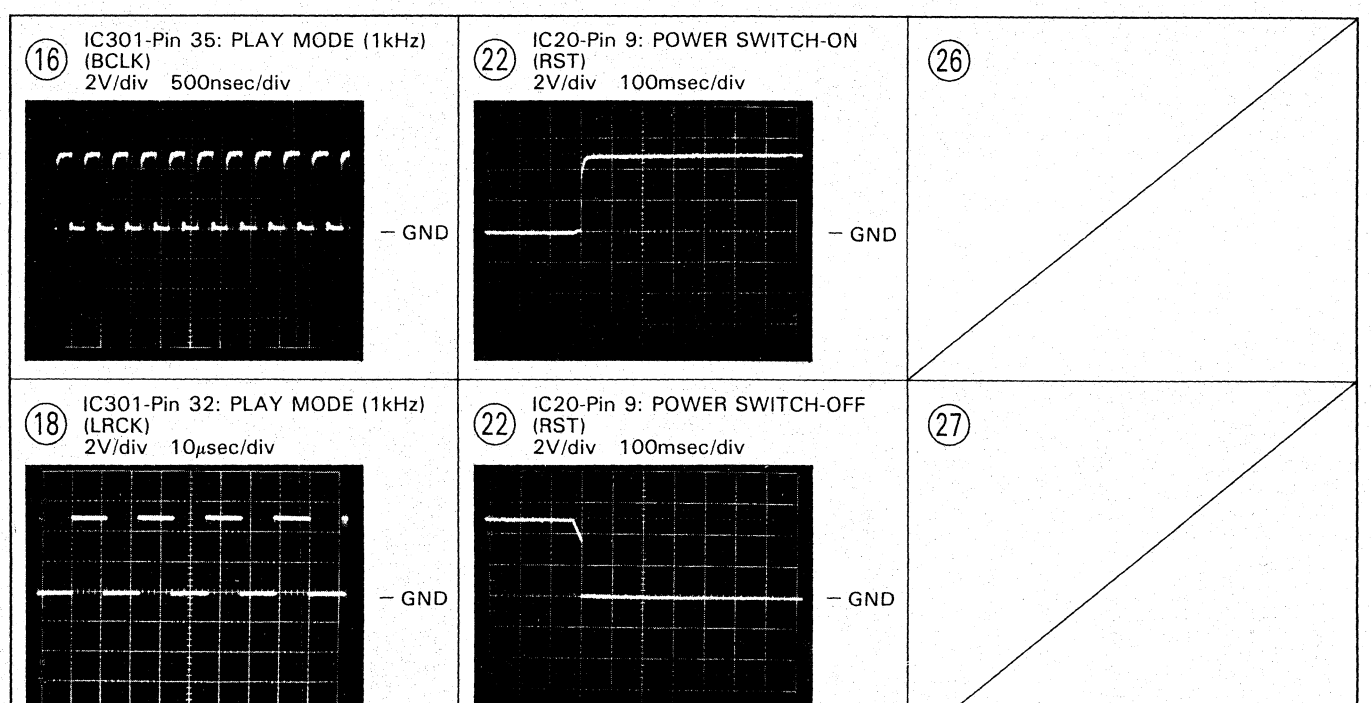


CXA1471S



CXD2500Q

TC923



(16) IC301-Pin 35: PLAY MODE (1kHz) (BCLK)
2V/div 500nsec/div
– GND

(22) IC20-Pin 9: POWER SWITCH-ON (RST)
2V/div 100msec/div
– GND

(26)

(18) IC301-Pin 32: PLAY MODE (1kHz) (LRCK)
2V/div 10μsec/div
– GND

(22) IC20-Pin 9: POWER SWITCH-OFF (RST)
2V/div 100msec/div
– GND

(27)

(19) IC301-Pin 34: PLAY MODE (1kHz) (DATA)
2V/div 500nsec/div
– GND

(23) : TRACK SEARCH MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 35 (MIRR)
2V/div 200μsec/div
– GND
– GND

(28)

(20) IC401-Pin 9, Pin 10:
PLAY MODE (1kHz) (D/A OUT)
2V/div 0.1μsec/div
– GND

(24) : PLAY MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 36 (DFCT)
5V/div 200μsec/div
– GND
– GND

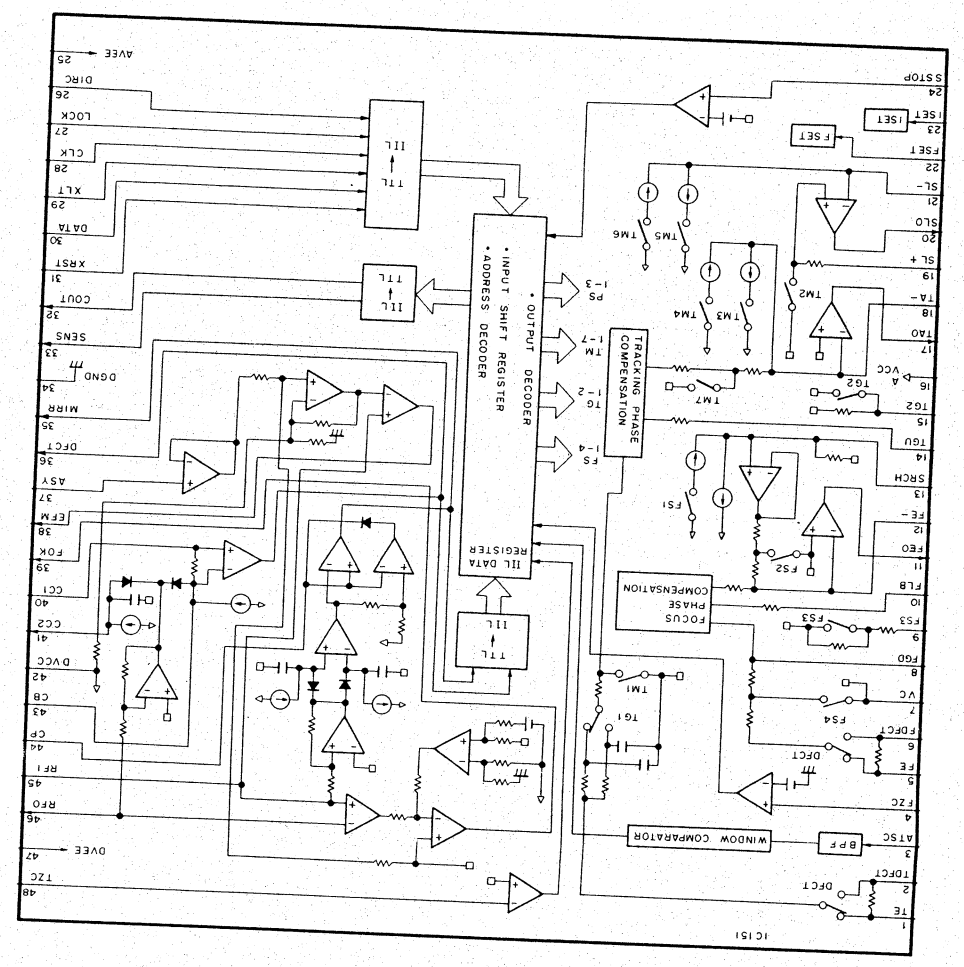
(33) IC301-Pin 4: PLAY MODE (MDP)
2V/div 2μsec/div
– GND

(21) Pin -OUTPUT: PLAY MODE (1kHz)
1V/div 200μsec/div
– GND

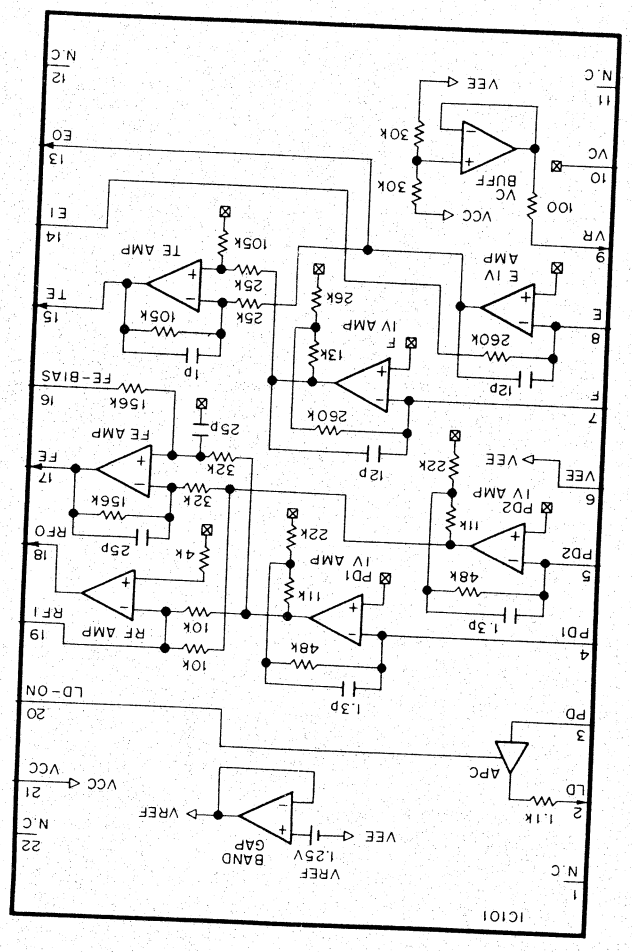
(25)

(53) IC301-Pin 20: PLAY MODE (PCO)
2V/div 10μsec/div
– GND

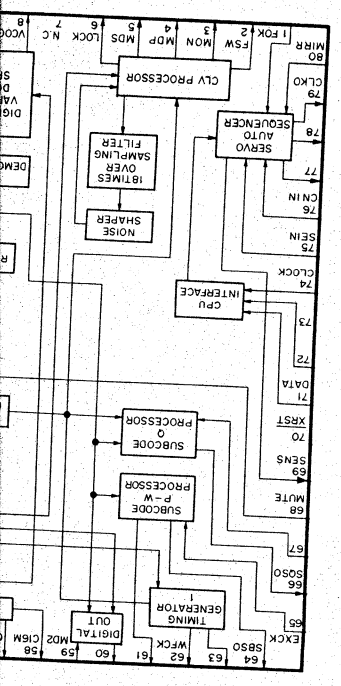
CXA1372S



CXA1471S

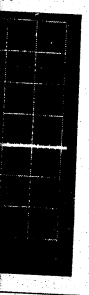


CXD2500Q



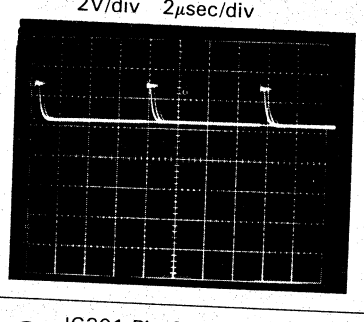
(26)

(27)

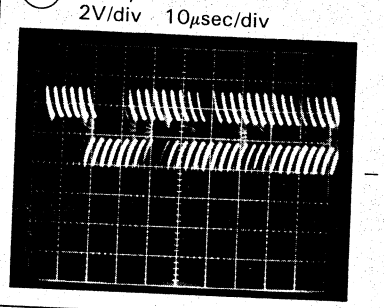


(28)

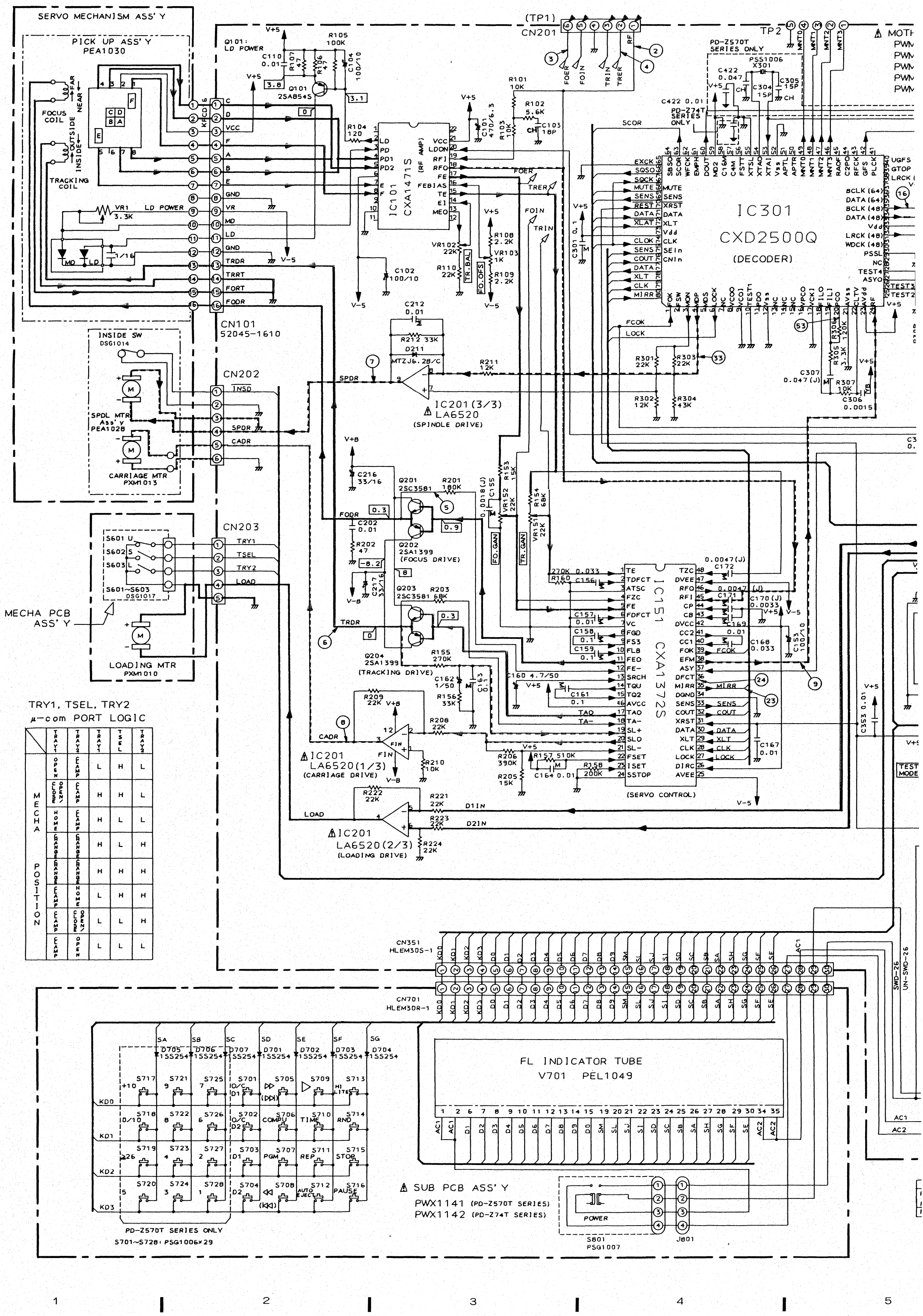
(33) IC301-Pin 4: PLAY MODE (MDP)
2V/div 2μsec/div



(53) IC301-Pin 20: PLAY MODE (PCO)
2V/div 10μsec/div



5.2 SCHEMATIC DIAGRAM



TRY1, TSEL, TRY2
μ-com PORT LOGIC

	TRAY1	TRAY2	TRAY1	TSEL	TRAY2
MECHA POSITION	OPEN	CLAMP	L	H	L
	CLOSE/OPEN	CLAMP	H	H	L
	HOME	CLAMP	H	L	L
	CHANGE	CHANGE	H	L	H
	CHANGE	HOME	L	H	H
	CLAMP	CHANGE	L	L	H
	CLAMP	OPEN	L	L	L

⚠ MOTHER PCB ASS'Y
PWM1345 (PD-Z570T/HEM)
PWM1346 (PD-Z570T/SD)
PWM1347 (PD-Z74T/HEMXJ, HBXJ)
PWM1348 (PD-Z74T/SD)
PWM1350 (PD-Z74T/HEM, HB, HPW)

PD-Z570T SERIES ONLY

: Foucus servo loop
: Signal route
: Tracking servo loop
: Carriage servo loop
: Loading motor route
: Spindle motor route
▶ : Measurement point

IC401: DIGITAL FILTER & D/A CONVERTER
IC401 TC9237N
IC404(1/2) NJM4558D-D
IC404(1/2), (2/2): LOW PASS FILTER
IC404(2/2) NJM4558D-D
Q403, Q404: MUTE
Q405 DTC124ES
Q405: MUTE DRIVE
JA401 PKB1009
Q403 2SD2144S
Q404 2SD2144S

IC351 PD4305B (SYSTEM CONTROL)
VSS1014 X351
Note:
The IC351 is replaced by PD4309A in the PD-Z74T /HEMXJ and HBXJ types.
PD4305B and PD4309A show different pin arrangements, but their functions are indentical.

IC351 PD4309A
FOR PD-Z74T/HEMXJ AND HBXJ TYPES ONLY
(SYSTEM CONTROL)
FLAT PACKAGE (Pin NO.)

Q381: BUFFER
Q382: BUFFER
2SC1740S Q381
2SC1740S Q382
D381 1SS254
D382 1SS254
D383 1SS254
D384 1SS254
D385 1SS254

TYPE	R392
PD-Z74T SERIES	9.1k
PD-Z570T SERIES	10k

JA391 PKN1004
CN381 KPE4
EN/REQ
DATA
CLK
GND

Cord with Connector
PDE1114 (Z570T)
PDE1067 (Z74T)
Connect With AMP

NOTES
CAPACITORS μF
M Mylar CQMA
CH Seramic CCCCH
YB Seramic CKCYB
YX Seramic CGCYX
Un Marked Type CKCYF
RESISTORS Ω
1/6W type:
Rating Identified where used
VR Ω
VRTB6VS

TRANSISTOR
PNPtype:DTA124ES
NPNtype:DTC124ES
OTHERS
⏚ :Chassis Ground

IC20: SYSTEM RESET & ±5V REGULATOR
IC20 M5298P
Q62: REGULATOR ON/OFF
Q62 2SC1740S

HPW: PDG1011
HEM, HEMXJ: PDG1008
HB, HBXJ: PDG1021
RDG1003
PSB1002
PTT1125
PTT1126
RKC-059
240V
220V
120-127V
110V
FOR HEM, HB, HPW, HEMXJ, HBXJ TYPES
FOR SD TYPE

TYPE	D54
PD-Z74T/HEM, HPW, HB, SD	MTZJ16B
PD-Z74T/HEMXJ, HBXJ	
PD-Z570T SERIES	MTZJ18B

Note:
PD-Z74T SERIES: PD-Z74T/HEM, HB, HEMXJ, SD, HPW TYPES.
PD-Z570T SERIES: PD-Z570T/HEM, SD TYPES.

1. RESISTORS:
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
: DC voltage (V) at no input signal

4. OTHERS:
: Signal route.
: Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5.SWITCH

MECHA PCB Assembly

S601 U
S602 S
S603 L

SUB PCB Assembly

S717 +10
S718 0/10
S719 ≧20
S720 5
S721 9
S722 8
S723 4
S724 3
S725 7
S726 6
S727 2
S728 1
(S717-S728:PD-Z570T SERIRS ONLY)

S701 O/C D1
S702 O/C D2
S703 D1
S704 D2
S705 ▶▶ (▶▶|)
S706 COMPU
S707 PGM
S708 ◀◀ (|◀◀)
S709 ▶
S710 TIME
S711 REP
S712 AUTO EJECT
S713 HI LITE
S714 RND
S715 STOP
S716 PAUSE
S801 POWER

The following corresponds with PD4309A.

PD4305A		PD4309A
1pin	⟷	27pin
2pin	⟷	28pin
38pin	⟷	64pin
39pin	⟷	1pin
63pin	⟷	25pin
64pin	⟷	26pin

List of semiconductor terminal voltage

Note: All terminal voltages are measured in the PLAY mode.

The PD-Z570T uses optical output, thus there is no IC401 (TC9237N), IC404(op Amp), Q403-Q405.

IC151
CXA1372S

Pin No.	Volts	Pin No.	Volts
1	0	25	-5
2	0	26	5
3	0	27	5
4	0	28	5
5	0	29	5
6	0	30	5
7	0	31	5
8	0	32	0
9	0	33	5
10	0	34	0
11	-1	35	0
12	0	36	N. C
13	0. 2	37	2. 5
14	0	38	2. 5
15	0	39	5
16	5	40	-1. 5
17	0	41	-1. 7
18	0	42	5
19	0	43	-0. 7
20	0.2~0.8	44	-1. 6
21	0	45	0
22	-4	46	0. 8
23	1. 3	47	-5
24	0	48	0

IC101
CXA1471S

Pin No.	Volts	Pin No.	Volts
1	N. C	16	0
2	2. 9	17	0
3	-4. 7	18	0. 8
4	0	19	0
5	0	20	5
6	-5	21	5
7	0	22	N. C
8	0		
9	N. C		
10	0		
11	N. C		
12	N. C		
13	-0. 9		
14	-0. 7		
15	0		

IC20
M5298P

Pin No.	Volts
1	−8. 2
2	N. C
3	−5
4	0
5	−8. 2
6	N. C
7	N. C
8	N. C
9	5
10	N. C
11	0. 7
12	5
13	8
14	5
15	1. 2
16	8

IC201
LA6520

Pin No.	Volts
1	0
2	0
3	−0. 7
4	0
5	0
6	0
7	1. 7
8	1. 7
9	0. 7
10	0
11	0
12	8
FIN	−8. 2

IC351
PD4305A

Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1	−10	17	1. 8	33	0	49	−22
2	−13. 5	18	0	34	5	50	0
3	−5. 5	19	5	35	0	51	5
4	−10. 5	20	0. 5	36	0	52	0
5	2. 1	21	5	37	0	53	0
6	4. 8	22	0	38	0	54	−26
7	4. 5	23	0	39	5	55	−26
8	3. 9	24	0	40	−22	56	−26
9	2. 3	25	5	41	−22	57	−5
10	0	26	5	42	−22	58	−9
11	5	27	5	43	−22	59	−11
12	2. 5	28	5	44	−22	60	5
13	5	29	5	45	−22	61	−2. 5
14	5	30	2. 5	46	−22	62	2
15	5	31	2. 5	47	−22	63	−2. 5
16	0	32	0	48	−22	64	5

IC404
NJM4558D−D

Pin No.	Volts
1	−0. 2
2	1
3	1
4	−5
5	1
6	1
7	−0. 2
8	5

IC401
TC9237N

Pin No.	Volts
1	5
2	0
3	5
4	5. 5
5	2. 5
6	2. 5
7	0
8	0
9	2. 5
10	2. 5
11	5
12	0
13	N. C
14	0
15	0
16	1. 9
17	1. 9
18	5
19	2
20	0
21	0
22	0
23	0
24	5
25	2. 5
26	2. 5
27	2. 5
28	5

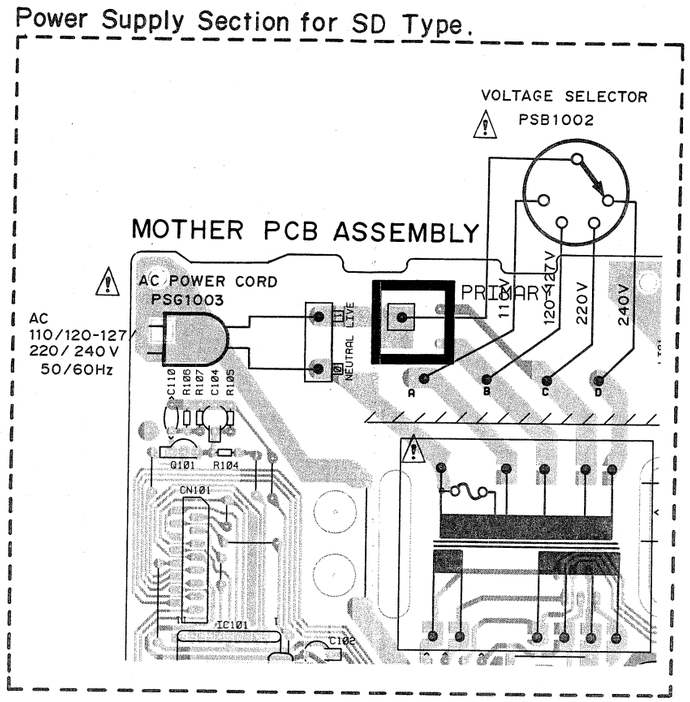
IC301
CXD2500Q

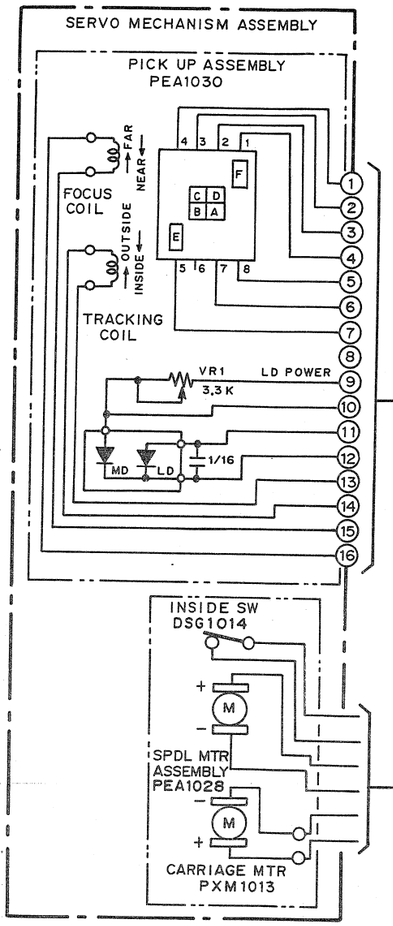
Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1	5	31	N. C	61	N. C
2	N. C	32	2. 5	62	N. C
3	5	33	5	63	0
4	2. 6	34	2. 5	64	N. C
5	N. C	35	2. 5	65	0
6	5	36	N. C	66	3.3～4.6
7	N. C	37	N. C	67	5
8	N. C	38	N. C	68	0
9	0	39	N. C	69	2.1～3
10	0	40	N. C	70	5
11	N. C	41	N. C	71	5
12	0	42	5	72	5
13	N. C	43	N. C	73	5
14	N. C	44	N. C	74	5
15	N. C	45	N. C	75	5
16	N. C	46	4. 4	76	0
17	0	47	0	77	5
18	2. 5	48	0	78	5
19	2. 4	49	0～0.3	79	5
20	2. 4	50	N. C	80	0
21	0	51	N. C		
22	2. 5	52	0		
23	5	53	2. 5		
24	2. 5	54	N. C		
25	N. C	55	0		
26	0	56	N. C		
27	2. 5	57	N. C		
28	0	58	N. C		
29	N. C	59	0		
30	0	60	N. C		

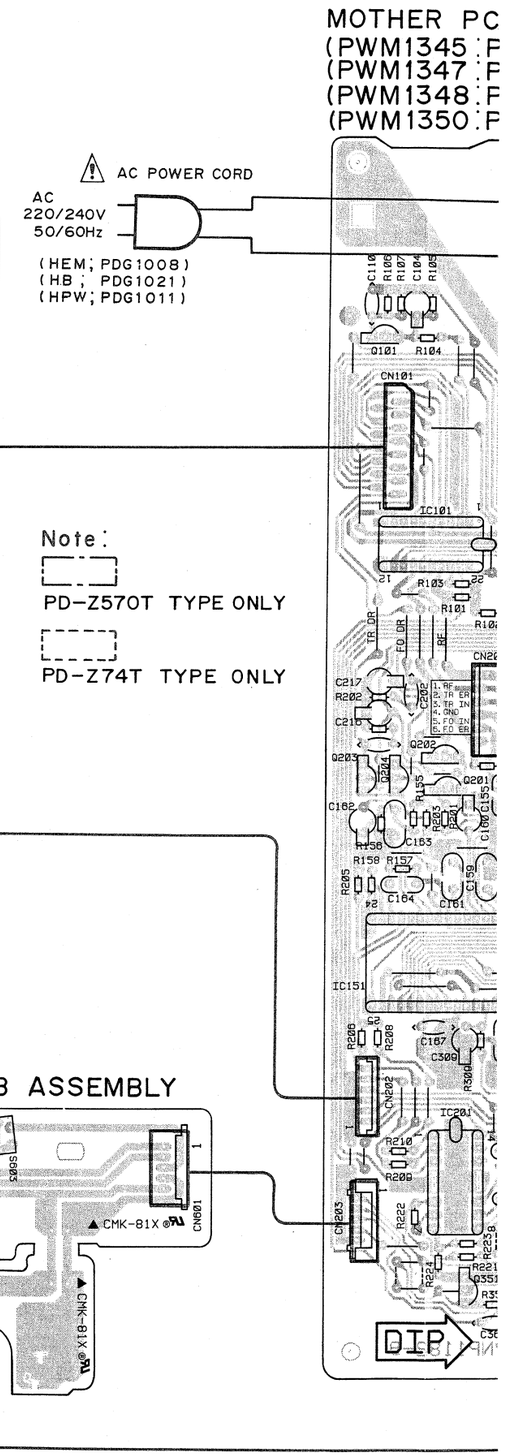
6. P.C. BOARDS CONNECTION DIAGRAM

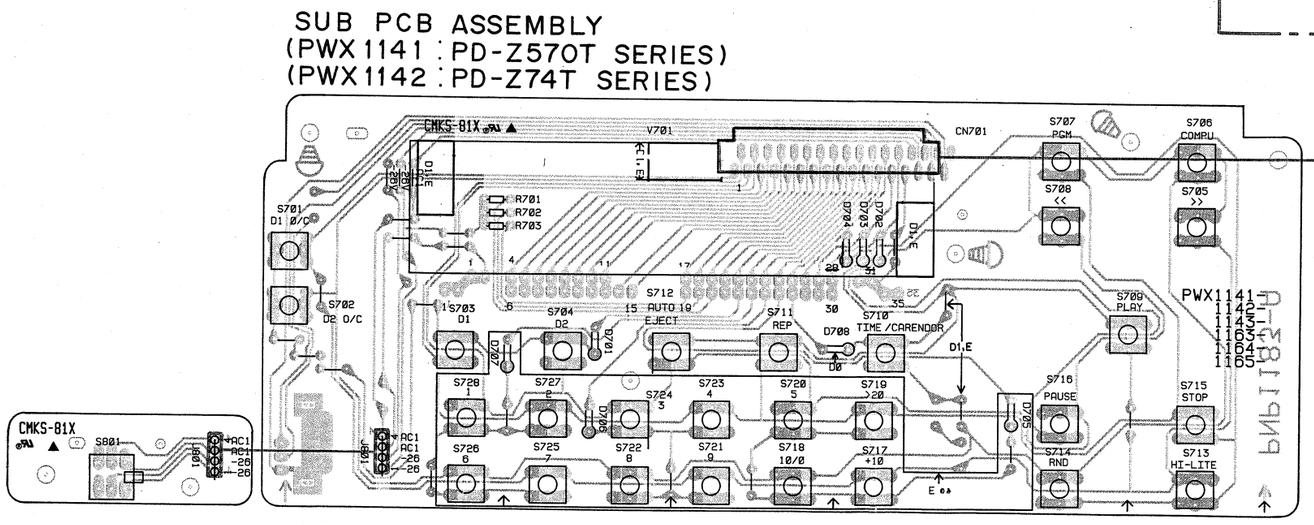
P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode			Styrol capacitor
					Electrolytic capacitor (Non polarized)
					Electrolytic capacitor (Noiseless)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			Semi-fixed resistor
		Tact switch			Resistor array
		Inductor			Resistor
		Coil			Resonator
		Transformer			Thermistor
		Filter			

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

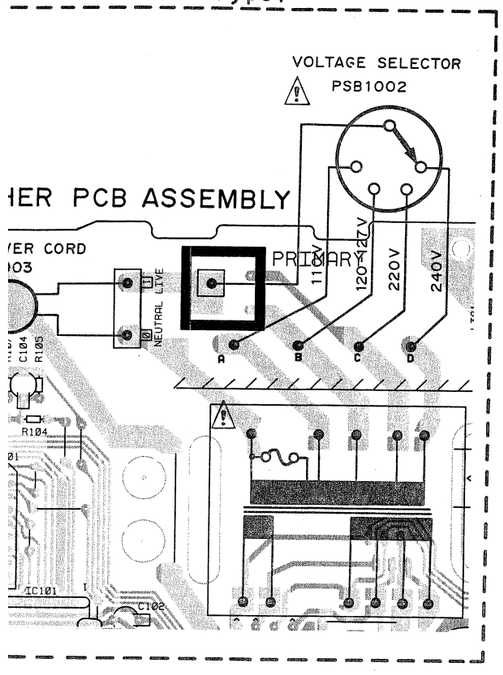


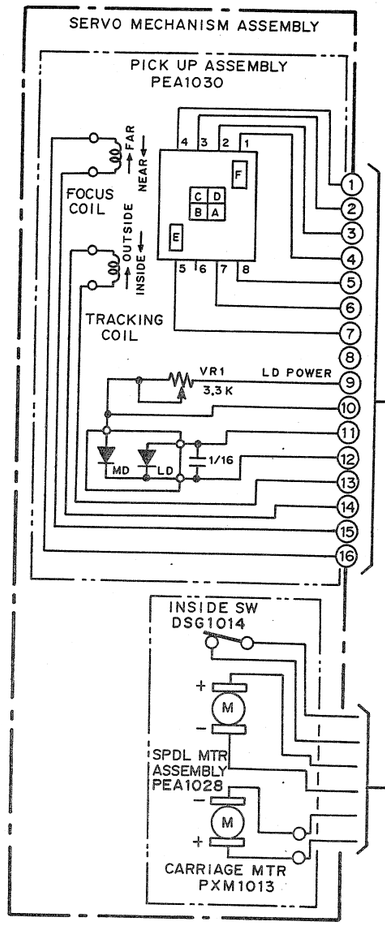


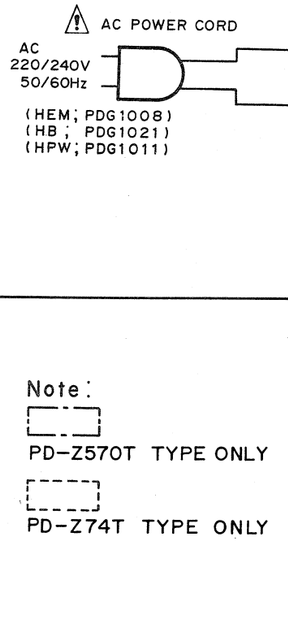




Section for SD Type.



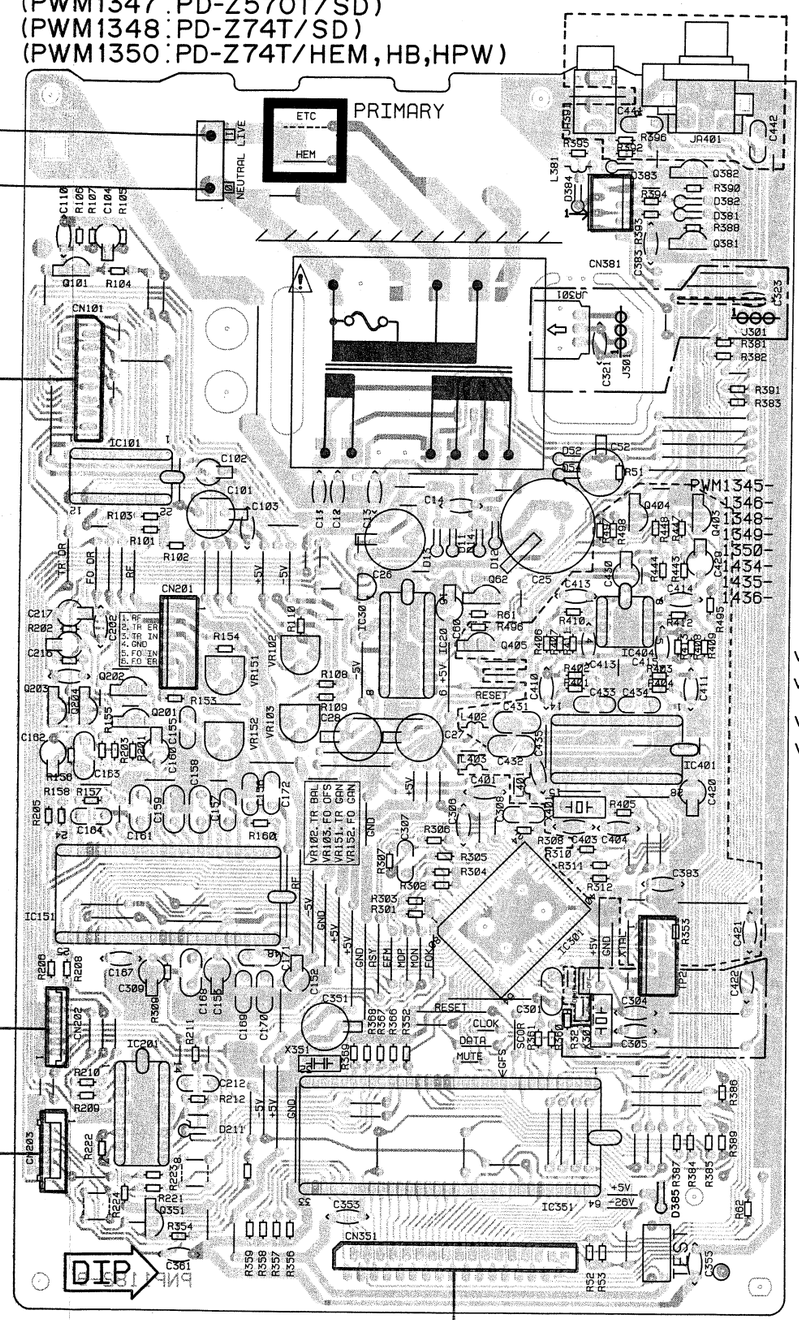


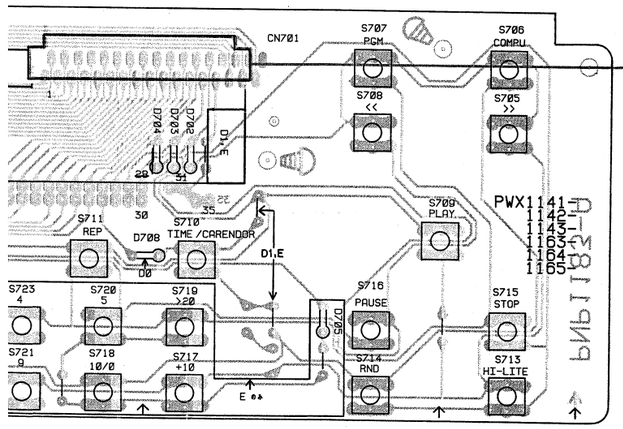


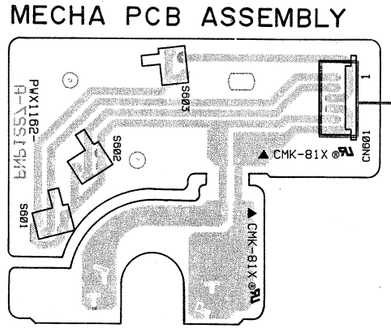
Note:

PD-Z570T TYPE ONLY

PD-Z74T TYPE ONLY

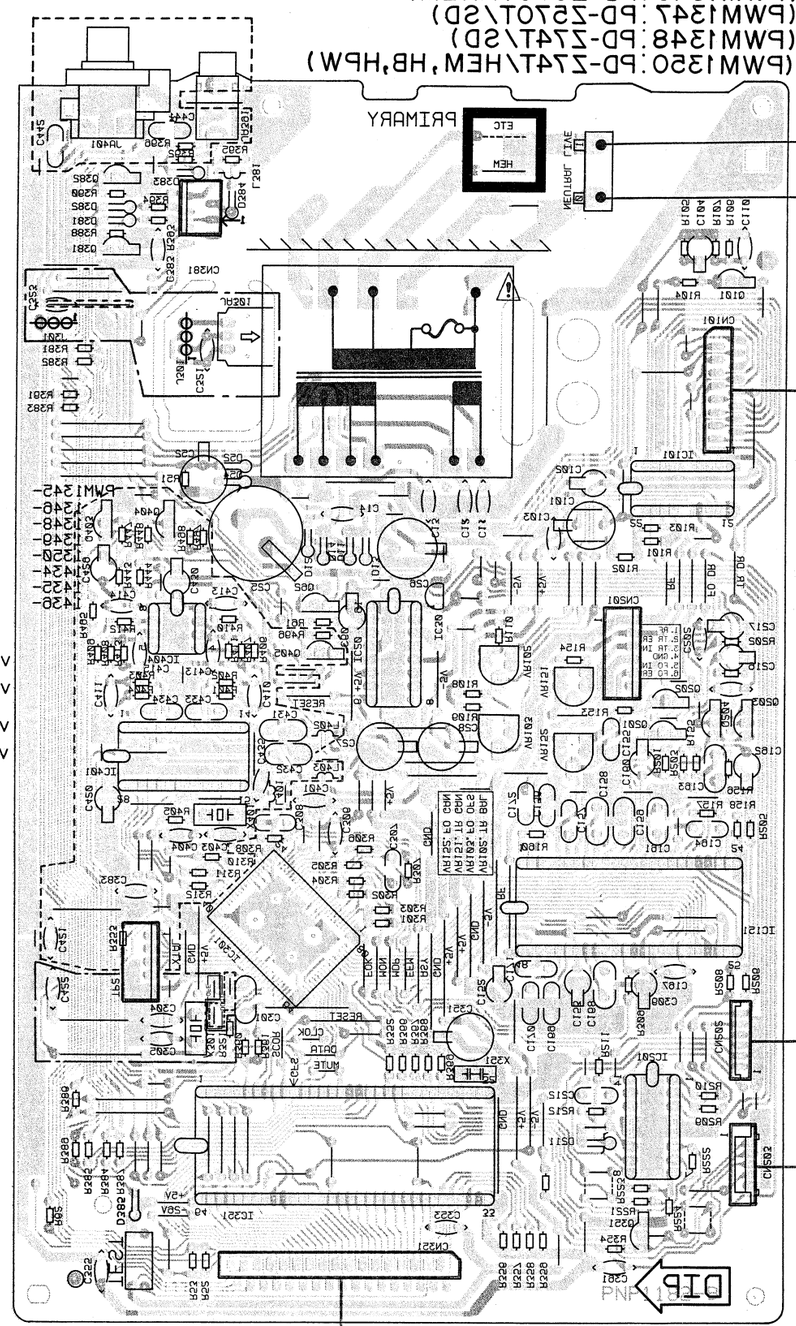






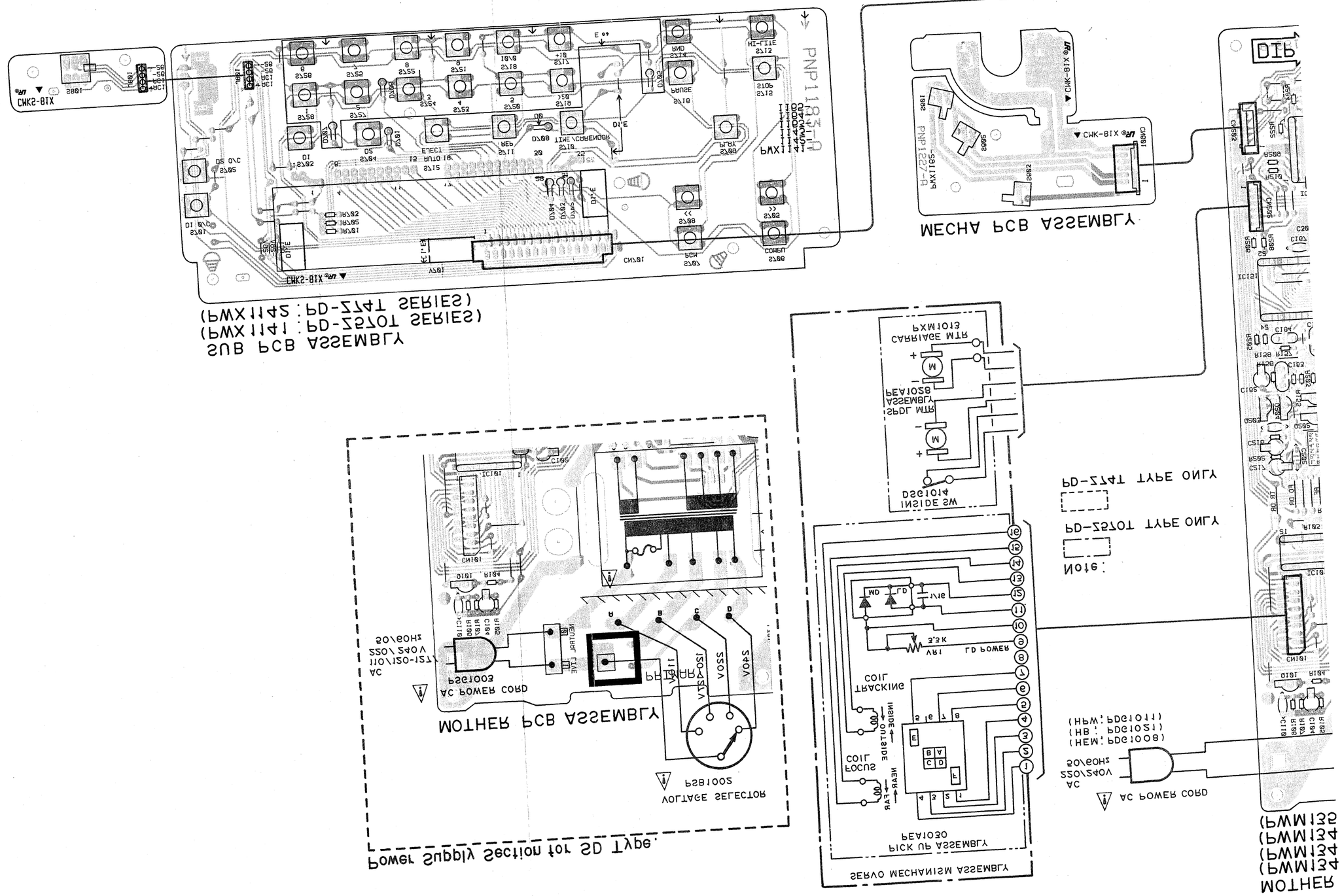
	Q382	
	Q381	
Q101		
IC101	Q404	
	Q403	
	IC30 Q62	IC404
VR102	IC20 Q405	
VR151	Q202	
VR103	Q203 Q204	
VR152	Q201	IC401
IC151	IC301	
IC201	IC351	
Q351		

MOTHER PCB ASSEMBLY
(PWM1345 :PD-25707\HEM)
(PWM1347 :PD-25707\SD)
(PWM1348 :PD-274T\SD)
(PWM1350 :PD-274T\HEM,HB,HPW)



6. P.C. BOARDS CONNECTION DIAGRAM

This P.C.B. connection diagram is viewed from the foil side.



7. P.C.B's PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω → 56 × 10^1 → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10^3 → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10^1 → 5621 ····· RN1/4SR 5 6 2 1 F

Mark	No.	Symbol & Description	Part No.
		⊙ MOTHER BOARD ASSEMBLY (PWM1350)(For PD-Z74T/HEM)	
		SEMICONDUCTORS	
⚠		IC20 REGULATOR IC	M5298P
⚠		IC30 IC PROTECTOR	ICP-N10
		IC101 PRE AMP IC	CXA1471S
		IC151 SERVO IC	CXA1372S
⚠		IC201 POWER OP-AMP, IC	LA6520
		IC301 EFM DEMODULATION IC	CXD2500Q
		IC351 MICROCOMPUTER	PD4305B
		IC401	TC9237N
		IC404 OP-AMP IC	NJM4558D-D
		Q62 TRANSISTOR	2SC1740S
		Q101 TRANSISTOR	2SA854S
		Q201 TRANSISTOR	2SC3581
		Q202 TRANSISTOR	2SA1399
		Q203 TRANSISTOR	2SC3581
		Q204 TRANSISTOR	2SA1399
		Q381, 382 TRANSISTOR	2SC1740S
		Q403, 404 TRANSISTOR	2SD2144S
		Q405 TRANSISTOR	DTC124ES
⚠		D11-14 DIODE	11ES2
⚠		D52 DIODE	11ES2
		D54 ZENNER DIODE	MTZJ16B
		D211 ZENNER DIODE	MTZJ6. 2B
		D381-385 DIODE	1SS254
		COILS/TRANSFORMERS	
		L381 AXIAL INDUCTOR	LAU010K
		L401 AXIAL COIL	LAUR22K
		L402, 403 AXIAL INDUCTOR	LAU010K
		CAPACITORS	
		C11-14 CERAMIC CAPACITOR	CKCYF103Z50
		C25 ELECTR. CAPACITOR	CEAS332M16
		C26 ELECTR. CAPACITOR	CEAS222M16
		C27 ELECTR. CAPACITOR	CEAS471M6R3
		C28 ELECTR. CAPACITOR	CEAS101M10
		C52 ELECTR. CAPACITOR	CEAS101M35
		C60 ELECTR. CAPACITOR	CEAS010M50
		C101 ELECTR. CAPACITOR	CEAS471M6R3
		C102 ELECTR. CAPACITOR	CEAS101M10
		C103 CERAMIC CAPACITOR	CCCCH180J50
		C104 ELECTR. CAPACITOR	CEAS101M10
		C110 CERAMIC CAPACITOR	CKCYF103Z50
		C153 ELECTR. CAPACITOR	CEAS101M10
		C155 MYLOR FILM CAPACITOR	CQMA182J50
		C156 MYLOR FILM CAPACITOR	CQMA333K50
		C157 MYLOR FILM CAPACITOR	CQMA103K50
		C158, 159 MYLOR FILM CAPACITOR	CQMA104K50
		C160 ELECTR. CAPACITOR	CEAS4R7M50
		C161 MYLOR FILM CAPACITOR	CQMA104K50
		C162 ELECTR. CAPACITOR	CEAS010M50
		C163 MYLOR FILM CAPACITOR	CQMA104K50
		C164 MYLOR FILM CAPACITOR	CQMA103K50
		C167 CERAMIC CAPACITOR	CKCYF103Z50
		C168 MYLOR FILM CAPACITOR	CQMA333K50
		C169 MYLOR FILM CAPACITOR	CQMA103K50
		C170 MYLOR FILM CAPACITOR	CQMA332J50
		C171 MYLOR FILM CAPACITOR	CQMA472J50
		C172 MYLOR FILM CAPACITOR	CQMA472K50
		C202 CERAMIC CAPACITOR	CKCYF103Z50
		C212 MYLOR FILM CAPACITOR	CQMA103K50
		C216, 217 ELECTR. CAPACITOR	CEAS330M16
		C301 MYLOR FILM CAPACITOR	CQMA104K50
		C306 CERAMIC CAPACITOR	CKCYB152K50
		C307 MYLOR FILM CAPACITOR	CQMA473J50
		C308 MYLOR FILM CAPACITOR	CQMA103K50
		C309 ELECTR. CAPACITOR	CEASR47M50
		C351 ELECTR. CAPACITOR	CEAS471M6R3
		C353 CERAMIC CAPACITOR	CKCYF103Z50
		C355 CERAMIC CAPACITOR	CKCYF103Z50
		C361 CERAMIC CAPACITOR	CKCYF103Z50
		C383, 384 CERAMIC CAPACITOR	CKCYF103Z50
		C401 CERAMIC CAPACITOR	CKCYF103Z50
		C403, 404 CERAMIC CAPACITOR	CCCCH470J50
		C410, 411 CERAMIC CAPACITOR	CCCSL560J50

Mark	No.	Symbol & Description	Part No.
		C412-415 CERAMIC CAPACITOR	CCCCH390J50
		C420 ELECTR. CAPACITOR	CEAS330M16
		C421 CERAMIC CAPACITOR	CKCYF473Z50
		C422 CERAMIC CAPACITOR	CKCYF103Z50
		C429, 430 ELECTR. CAPACITOR	CEAS220M25
		C431, 432 MYLOR FILM CAPACITOR	CQMA104K50
		C433, 434 MYLOR FILM CAPACITOR	CQMA103K50
		C435 CERAMIC CAPACITOR	CKCYF103Z50
		C441, 442 MYLOR FILM CAPACITOR	CQMA152J50
		RESISTORS	
		R51-53 CARBONFILM RESISTOR	RD1/6PM□□□J
		R61, 62 CARBONFILM RESISTOR	RD1/6PM□□□J
		R101-110 CARBONFILM RESISTOR	RD1/6PM□□□J
		R153-158 CARBONFILM RESISTOR	RD1/6PM□□□J
		R160 CARBONFILM RESISTOR	RD1/6PM□□□J
		R201-203 CARBONFILM RESISTOR	RD1/6PM□□□J
		R205, 206 CARBONFILM RESISTOR	RD1/6PM□□□J
		R208-212 CARBONFILM RESISTOR	RD1/6PM□□□J
		R221-224 CARBONFILM RESISTOR	RD1/6PM□□□J
		R301-312 CARBONFILM RESISTOR	RD1/6PM□□□J
		R352, 353 CARBONFILM RESISTOR	RD1/6PM□□□J
		R356-360 CARBONFILM RESISTOR	RD1/6PM□□□J
		R366-369 CARBONFILM RESISTOR	RD1/6PM□□□J
		R381-396 CARBONFILM RESISTOR	RD1/6PM□□□J
		R401-413 CARBONFILM RESISTOR	RD1/6PM□□□J
		R443, 444 CARBONFILM RESISTOR	RD1/6PM□□□J
		R447, 448 CARBONFILM RESISTOR	RD1/6PM□□□J
		R495-498 CARBONFILM RESISTOR	RD1/6PM□□□J
		VR102 VR	RCP1046
		VR103 VR	RCP1044
		VR151, 152 VR	RCP1046
		OTHERS	
		CN101 CONNECTOR	52045-1610
		CN351 CONNECTOR	HLEM30S-1
		CN381 CONNECTOR(4P)	KPE4
		JA391 JACK/12V	PKN1004
		JA401 JACK	PKB1009
		X351 CERAMIC RESONATOR	VSS1014
		X401 XTAL RES (OSC)	PSS1006

Mark	No.	Symbol & Description	Part No.
		⊙ MOTHER BOARD ASSEMBKLY (PWM1345)(For PD-Z570T/HEM)	
		SEMICONDUCTORS	
⚠		IC20 REGULATOR IC	M5298P
⚠		IC30 IC PROTECTOR	ICP-N10
		IC101 PRE AMP IC	CXA1471S
		IC151 SERVO IC	CXA1372S
⚠		IC201 POWER OP-AMP, IC	LA6520
		IC301 EFM DEMODULATION IC	CXD2500Q
		IC351 MICROCOMPUTER	PD4305B
		Q62 TRANSISTOR	2SC1740S
		Q101 TRANSISTOR	2SA854S
		Q201 TRANSISTOR	2SC3581
		Q202 TRANSISTOR	2SA1399
		Q203 TRANSISTOR	2SC3581
		Q204 TRANSISTOR	2SA1399
		Q381, 382 TRANSISTOR	2SC1740S
⚠		D11-14 DIODE	11ES2
⚠		D52 DIODE	11ES2
		D54 ZENNER DIODE	MTZJ18B
		D211 ZENNER DIODE	MTZJ6.2B
		D381-385 DIODE	1SS254
		COILS/TRANSFORMERS	
		L381 AXIAL INDUCTOR	LAU010K
		CAPACITORS	
		C11-14 CERAMIC CAPACITOR	CKCYF103Z50
		C25 ELECTR. CAPACITOR	CEAS332M16
		C26 ELECTR. CAPACITOR	CEAS222M16
		C27 ELECTR. CAPACITOR	CEAS471M6R3
		C28 ELECTR. CAPACITOR	CEAS101M10
		C52 ELECTR. CAPACITOR	CEAS101M35
		C60 ELECTR. CAPACITOR	CEAS010M50
		C101 ELECTR. CAPACITOR	CEAS471M6R3
		C102 ELECTR. CAPACITOR	CEAS101M10
		C103 CERAMIC CAPACITOR	CCCCH180J50
		C104 ELECTR. CAPACITOR	CEAS101M10
		C110 CERAMIC CAPACITOR	CKCYF103Z50
		C153 ELECTR. CAPACITOR	CEAS101M10
		C155 MYLOR FILM CAPACITOR	CQMA182J50
		C156 MYLOR FILM CAPACITOR	CQMA333K50
		C157 MYLOR FILM CAPACITOR	CQMA103K50
		C158, 159 MYLOR FILM CAPACITOR	CQMA104K50
		C160 ELECTR. CAPACITOR	CEAS4R7M50
		C161 MYLOR FILM CAPACITOR	CQMA104K50
		C162 ELECTR. CAPACITOR	CEAS010M50
		C163 MYLOR FILM CAPACITOR	CQMA104K50
		C164 MYLOR FILM CAPACITOR	CQMA103K50
		C167 CERAMIC CAPACITOR	CKCYF103Z50
		C168 MYLOR FILM CAPACITOR	CQMA333K50
		C169 MYLOR FILM CAPACITOR	CQMA103K50
		C170 MYLOR FILM CAPACITOR	CQMA332J50
		C171 MYLOR FILM CAPACITOR	CQMA472J50
		C172 MYLOR FILM CAPACITOR	CQMA472K50
		C202 CERAMIC CAPACITOR	CKCYF103Z50

Mark	No.	Symbol & Description	Part No.
		C212 MYLOR FILM CAPACITOR	CQMA103K50
		C216, 217 ELECTR. CAPACITOR	CEAS330M16
		C301 MYLOR FILM CAPACITOR	CQMA104K50
		C304, 305 CERAMIC CAPACITOR	CCCCH150J50
		C306 CERAMIC CAPACITOR	CKCYB152K50
		C307 MYLOR FILM CAPACITOR	CQMA473J50
		C308 MYLOR FILM CAPACITOR	CQMA103K50
		C309 ELECTR. CAPACITOR	CEASR47M50
		C321 CERAMIC CAPACITOR	CKCYF103Z50
		C323 CERAMIC CAPACITOR	CKCYF103Z50
		C351 ELECTR. CAPACITOR	CEAS471M6R3
		C353 CERAMIC CAPACITOR	CKCYF103Z50
		C355 CERAMIC CAPACITOR	CKCYF103Z50
		C361 CERAMIC CAPACITOR	CKCYF103Z50
		C401 CERAMIC CAPACITOR	CKCYF103Z50
		C422 CERAMIC CAPACITOR	CKCYF473Z50
RESISTORS			
		R51-53 CARBONFILM RESISTOR	RD1/6PM□□□J
		R61, 62 CARBONFILM RESISTOR	RD1/6PM□□□J
		R101-110 CARBONFILM RESISTOR	RD1/6PM□□□J
		R153-158 CARBONFILM RESISTOR	RD1/6PM□□□J
		R160 CARBONFILM RESISTOR	RD1/6PM□□□J
		R201-203 CARBONFILM RESISTOR	RD1/6PM□□□J
		R205, 206 CARBONFILM RESISTOR	RD1/6PM□□□J
		R208-212 CARBONFILM RESISTOR	RD1/6PM□□□J
		R221-224 CARBONFILM RESISTOR	RD1/6PM□□□J
		R301-309 CARBONFILM RESISTOR	RD1/6PM□□□J
		R321 CARBONFILM RESISTOR	RD1/6PM□□□J
		R352 CARBONFILM RESISTOR	RD1/6PM□□□J
		R356-360 CARBONFILM RESISTOR	RD1/6PM□□□J
		R366-369 CARBONFILM RESISTOR	RD1/6PM□□□J
		R381-395 CARBONFILM RESISTOR	RD1/6PM□□□J
		VR102 VR	RCP1046
		VR103 VR	RCP1044
		VR151, 152 VR	RCP1046
OTHERS			
		CN101 CONNECTOR	52045-1610
		CN351 CONNECTOR	HLEM30S-1
		CN381 CONNECTOR(4P)	KPE4
		JA301 OPTICAL OUTPUT JACK	TOTX178
		X301 XTAL RES (OSC)	PSS1006
		X351 CERAMIC RESONATOR	VSS1014

Mark	No.	Symbol & Description	Part No.
⊙ SUB BOARD ASSEMBLY (PWX1142)(For PD-Z74T/HEM)			
SEMICONDUCTORS			
		D701-704 DIODE	1SS254
SWITCHES			
		S701-716 SWITCH	PSG1006
		S801 SWITCH	PSG1007
OTHERS			
		CN701 CONNECTOR	HLEM30R-1
		V701 FL INDICATOR TUBE	PEL1049
⊙ SUB BOARD ASSEMBLY (PWX1141)(For PD-Z570T/HEM)			
SEMICONDUCTORS			
		D701-707 DIODE	1SS254
SWITCHES			
		S701-728 SWITCH	PSG1006
		S801 SWITCH	PSG1007
OTHERS			
		CN701 CONNECTOR	HLEM30R-1
		V701 FL INDICATOR TUBE	PEL1049
MECHANISM P.C.B ASSEMBLY			
SWITCHES			
		S601-603 PUSH SWITCH	DSG1017

8. ADJUSTMENTS

1. Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

1-1 Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP1, Pin 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Grating adjustment	TP1, Pin 2 (TRK. ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Pickup radial/ tangential direction tilt adjustment	TP1, Pin 1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP1, Pin 1 (RF)	VR1 (RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5 (FCS. IN) TP1, Pin 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3 (TRK. IN) TP1, Pin 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Focus error signal verification	TP1, Pin 6 (FCS. ERR)	———

● **Abbreviation table**

FCS. ERR : Focus Error
FCS. OFS : Focus Offset
TRK. ERR : Tracking Error
TRK. BAL : Tracking Balance
FCS. IN : Focus In
TRK. IN : Tracking In

1-2 Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. 12-cm disc (with at least about 70 minutes of recording)
5. Low-pass filter (39 kΩ + 0.001 μF)
6. Resistor (100 kΩ)
7. Hexagonal wrench (M3 mm)
8. Standard tools

1-3 Test point and adjustment variable resistor positions

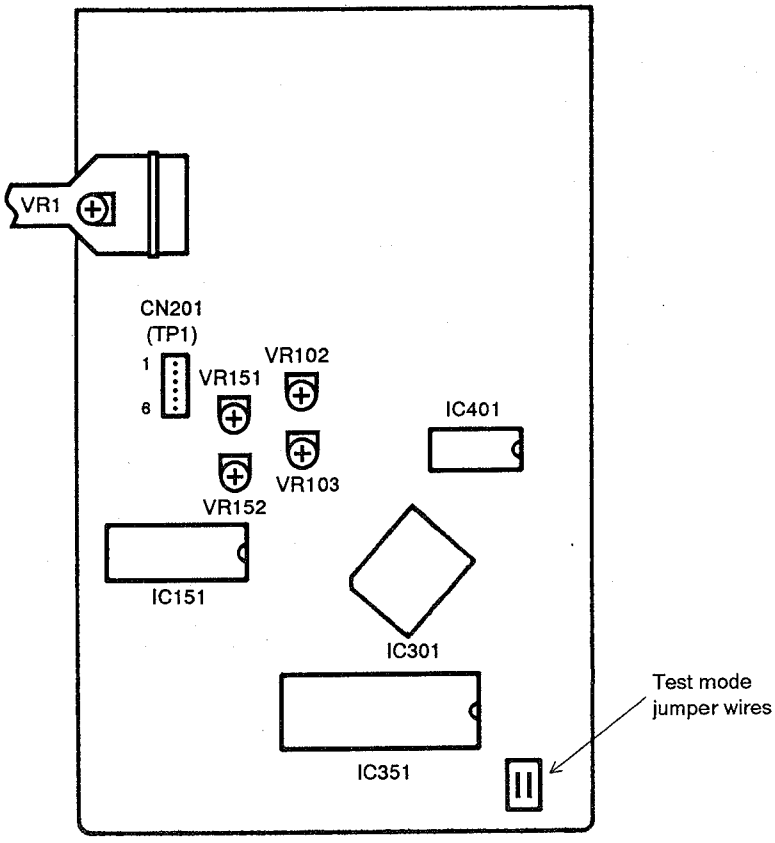


Figure 1 Adjustment Locations

1-4 Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

1-5 Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.

1. Turn off the power switch.
2. Short the test mode jumper wires. (See Figure 1.)
3. Turn on the power switch.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1-3.

[Release from test mode]

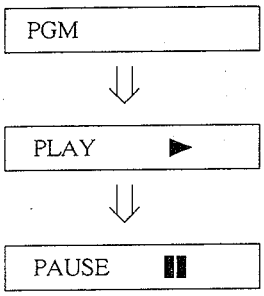
Here is the procedure for releasing the test mode:
1. Press the STOP key and stop all operations.
2. Turn off the power switch on the front panel.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
	PGM (PROGRAM)	Focus servo close	If Disc Tray 1 is closed, Disk Tray 1 is moved to the play position. Then the laser diode is lit up and the focus actuator is lowered, then raised slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled down, then the actuator is raised and lowered twice and returned to its original position.
▶	PLAY	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.
▮▮	PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.
⏮/ ◀◀	TRACK/ MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
▶▶/ ⏭	TRACK/ MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
■	STOP	Stop	Switches off all the servos and initializes. The pickup remains where it was when this key was pressed.
⏏	OPEN/CLOSE DISC 1	Disc tray open/close	Opens/closes the disc tray. This key is a toggle key and open/close tray alternately.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.



Lights up the laser diode and closes the focus servo.

Starts the spindle motor and closes the spindle servo.

Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus offset adjustment

● Objective ● Symptom when out of adjustment	Sets the DC offset for the focus error amp. The player does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR103 (FCS OFS) None needed

[Procedure]

Adjust VR103 (FCS OFS) so that the DC voltage at TP1, Pin 6 (FCS ERR) is –50 ± 50 mV.

2. Grating adjustment

● Objective ● Symptom when out of adjustment	To align the tracking error generation laser beam spots to the optimum angle on the track Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR) via a low pass filter. (See Figure 2) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open Pickup grating adjustment slit 12 cm disc. (YEDS-7 can not be used.)

[Procedure]

1. Move the pickup to the outer edge of the disc with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key so that the grating adjustment slit is at the outer edge of the disc where it can be adjusted.
2. Press the PGM key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver counterclockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver counterclockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

   Reference: Figure 3 shows the relation between the angle of the tracking beam with the track and the wave form.

   Note: The amplitude of the tracking error signal is about 3 Vp-p (when a 39 kΩ + 0.001 µF low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), the objective lens may be dirty or the pickup malfunctioning. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.
5. Return the pickup to more or less midway across the disc with the TRACK/MANUAL SEARCH REV |◀◀ / ◀◀ key, press the PAUSE ▮▮ key and check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, check the null point and adjust the grating again.

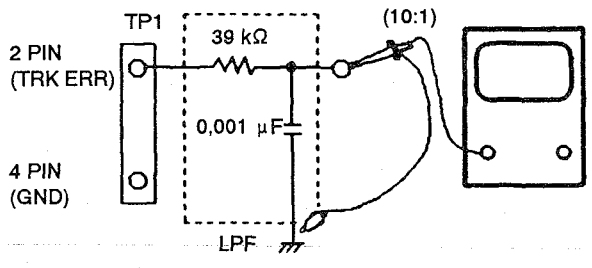
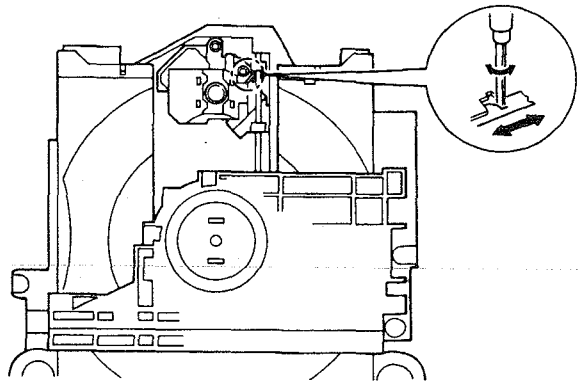


Figure 2



Adjustment Locations

[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the wave form is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)
This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

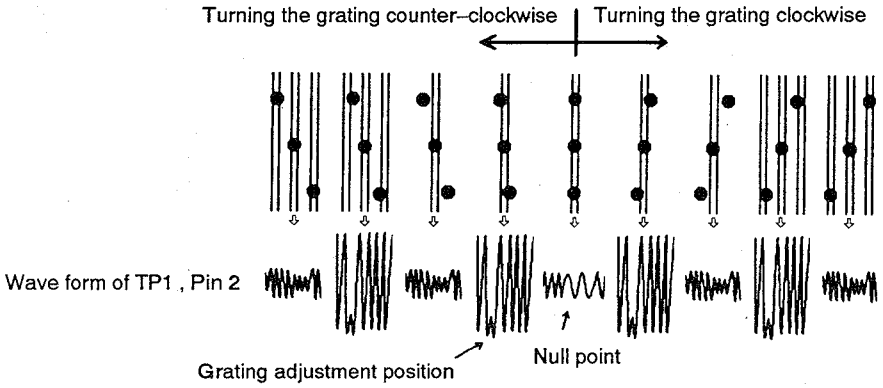
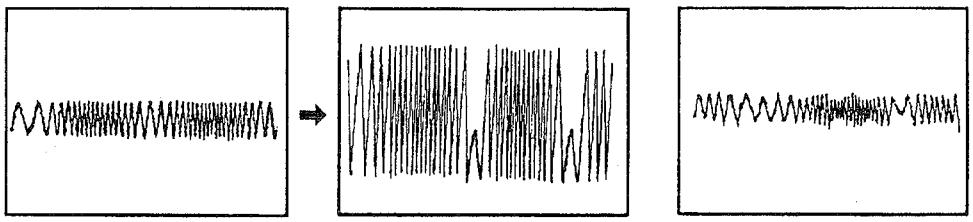

Turning the grating counter–clockwise
Turning the grating clockwise
Wave form of TP1 , Pin 2
Grating adjustment position
Null point

Figure 3



Nullo point waveform

Maximum amplitude waveform

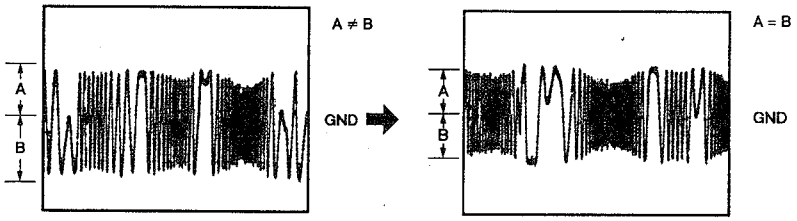
Waveform other than the null point

3. Tracking error balance adjustment

● Objective ● Symptom when out of adjustment	To correct for the variation in the sensitivity of the tracking photodiode Play does not start or track search is impossible		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open VR102 (TRK BAL) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key.
2. Press the PGM key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK BAL) so that positive amplitude and negative amplitude of the tracking error signal at TP1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

4. Pickup radial/tangential tilt adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state	Test mode, play
		● Adjustment location	Pickup radial tilt adjustment screw and tangential tilt adjustment screw
		● Disc	12 cm disc. (YEDS-7 can not be used.)

[Procedure]

1. Move the pickup to the outer edge of the disc with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key so that the radial/tangential tilt screws can be adjusted.
   Press the PGM key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the focus servo then the spindle servo and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with an M3 mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with an M3 mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

   Note: Radial and tangential mean the directions relative to the disc shown in Figure 4.

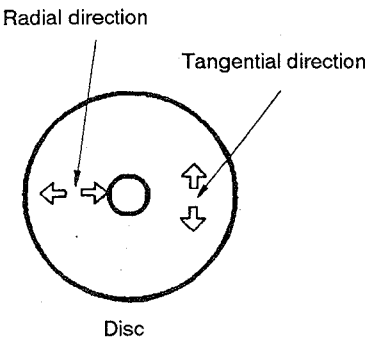
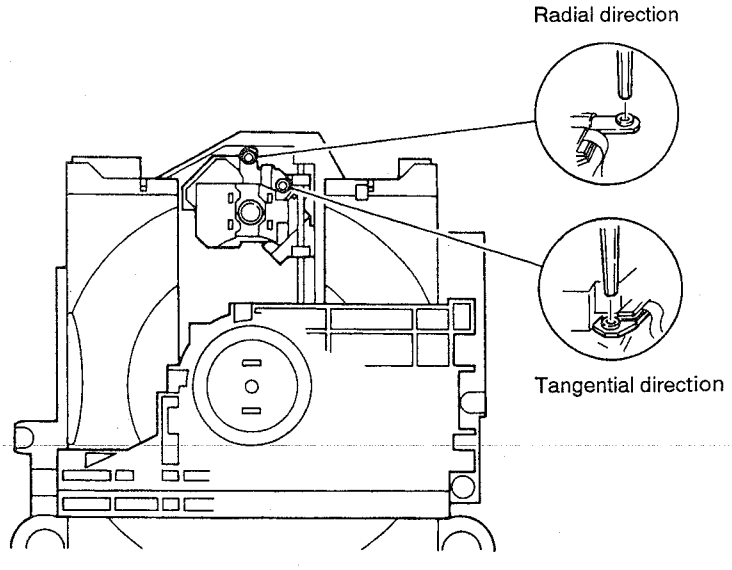


Figure 4



Adjustment Locations

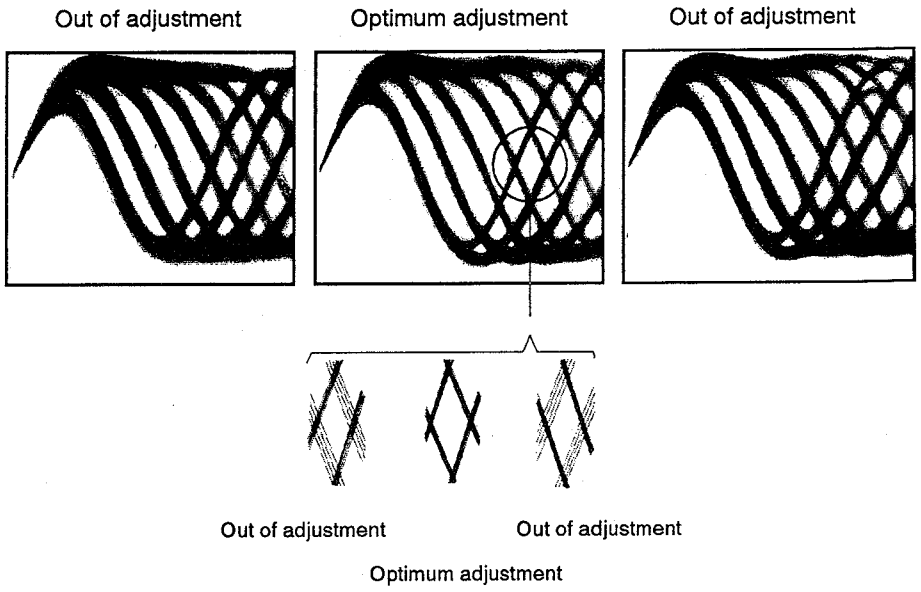


Figure 5 Eye Pattern

5. RF level adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play VR1 (laser power) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key, then press the PGM key, then the PLAY ▶ key in that order to close the respective servos and put the player into play mode.
2. Adjust VR1 (laser power) so that the RF signal amplitude is 1.2 Vp-p ± 0.1V.

6. Focus servo loop gain adjustment

● Objective	To optimize the focus servo loop gain		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy		
● Measurement instrument connections	See Figure 6. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR152 (FCS GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PGM key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

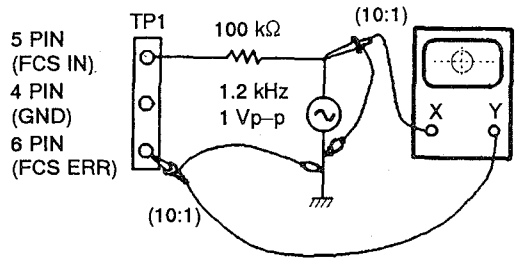
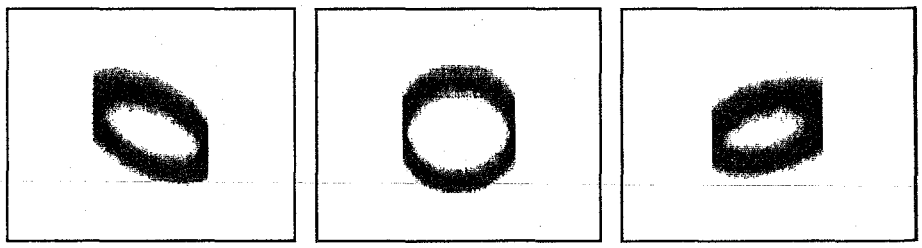


Figure 6

Focus Gain Adjustment



Higher gain | Optimum gain | Lower gain

7. Tracking servo loop gain adjustment

● Objective ● Symptom when out of adjustment	To optimize the tracking servo loop gain Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 7. [Settings] CH1 CH2 50 mV/division 50 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR151 (TRK GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PGM key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

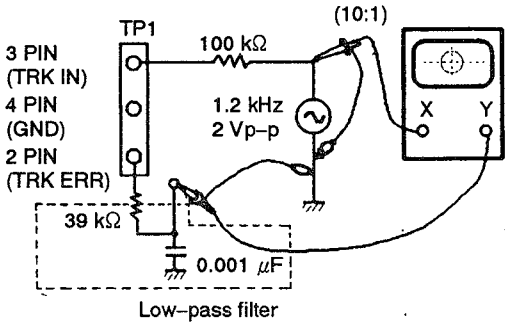
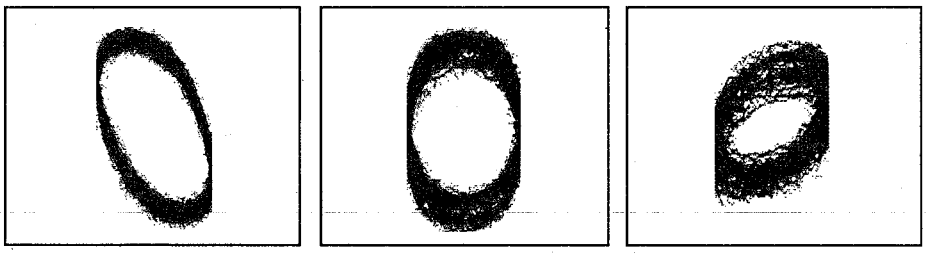


Figure 7

Tracking Gain Adjustment



Higher gain Optimum gain Lower gain

8. Focus error signal (focus S curve) verification

● Objective ● Symptom when out of adjustment	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP1 Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PGM key and observe the wave form in Figure 8 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the wave form is only output for a moment when the PGM key is pressed, press this key over and over until you have checked the wave form.

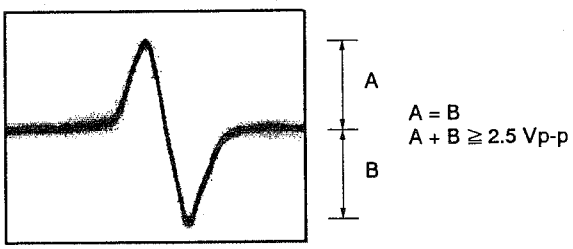


Figure 8

[Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2:1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR1 is adjusted (laser power), the RF signal can not be brought up to the standard level.

8. RÉGLAGE

1. Méthodes de réglage

Si le lecteur CD est mal réglé, il risque de ne plus fonctionner normalement, voire ne plus fonctionner du tout, même si le capteur et la circuiterie en présentent aucune anomalie. Par conséquent, ajuster le lecteur correctement en suivant les démarches de réglage.

1-1 Points de réglage/Point et ordre de vérification

Etape	Point	Point d'essai	Emplacement du réglage
1	Réglage du décalage de la mise au point	TP1, Broche 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Réglage du réseau de diffraction	TP1, Broche 2 (TRK. ERR)	Fente de réglage du réseau de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP1, Broche 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Réglage d'inclinaison radiale/tangentielle du capteur	TP1, Broche 1 (RF)	Vis de réglage d'inclinaison radiale, Vis de réglage d'inclinaison tangentielle
5	Réglage du niveau RF	TP1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de boucle asservie de la mise au point	TP1, Broche 5 (FCS. IN) TP1, Broche 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Réglage de gain de boucle asservie de l'alignement	TP1, Broche 3 (TRK. IN) TP1, Broche 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Vérification du signal d'erreur de la mise au point	TP1, Broche 6 (FCS. ERR)	———

● **Tableau des abbréviations**

FCS. ERR : erreur de mise au point
FCS. OFS : décalage de mise au point
TRK. ERR : erreur d'alignement
TRK. BAL : équilibrage d'erreur d'alignement
FCS. IN : mise au point correcte
TRK. IN : alignement correct

1-2 Intruments de mesure et outils

1. Oscilloscope cathodique à deux faisceaux (sonde 10:1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Disque de 12 cm (avec au moins 70 minutes d'enregistrement)
5. Filtre passe-bas (39 kΩ + 0,001 μF)
6. Résistance (100 kΩ)
7. Clé hexagonale (M3 mm)
8. Outils conventionnels

1–3 Point d'essai et positions de réglage de la résistance variable

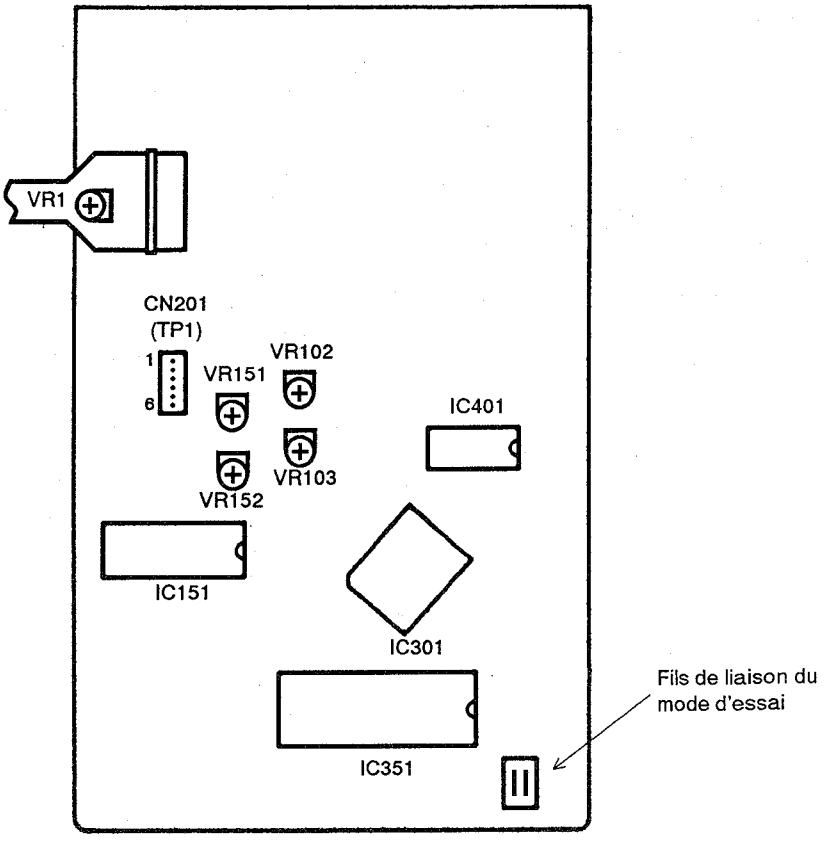


Figure 1 Emplacement des Réglages

1–4 Remarques

1. Utiliser une sonde 10:1 pour l'oscilloscope.
2. Toutes les positions (réglages) des boutons de l'oscilloscope, dans les démarches de réglage, sont conçues pour l'usage d'une sonde 10:1.

1–5 Mode d'essai

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire. Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en mode d'essai]

Voici la manière de mettre le modèle en mode d'essai.

1. Commuter l'interrupteur d'alimentation sur arrêt.
2. Court-circuiter les fils de liaison du mode d'essai. (voir Figure 1.)
3. Commuter l'interrupteur d'alimentation sur marche.

Quand le mode d'essai est correctement réglé, l'affichage est différent de celui qui apparaît généralement à la mise sous tension. Si l'affichage reste le même, le mode d'essai n'a pas été réglé correctement. Dans ce cas, répéter les étapes 1 à 3.

[Pour sortir du mode d'essai]

Voici la procédure pour sortir du mode d'essai.

1. Appuyer sur la touche STOP pour arrêter toutes les opérations.
2. Sur le panneau avant, commuter l'interrupteur d'alimentation sur arrêt.

[Fonctionnement des touches en mode d'essai]

Code	Nom de la touche	Fonction en mode d'essai	Explications
	PGM (PROGRAMME)	Fermeture du circuit asservi de la mise au point	Si le plateau n° 1 est fermé, il se place en mode de lecture. Ensuite la diode laser s'allume et l'actuateur de la mise au point s'abaisse, puis se relève lentement et le circuit servo de la mise au point se ferme au point où la lentille de l'objectif se focalise sur le disque. Quand l'appareil est dans cet état, si l'on fait légèrement tourner à la main le disque arrêté, le bruit produit par le circuit servo de la mise au point sera audible. Si ce bruit est perçu, le circuit servo de la mise au point fonctionne correctement. Si cette touche est enclenchée et qu'aucun disque n'est installé, la diode laser s'allume, l'actuateur de la mise au point s'abaisse, se relève, puis s'abaisse une deuxième fois et enfin, revient à sa position de départ.
►	PLAY	Asservissement de rotation en service	Démarre le moteur de rotation dans le sens des aiguilles d'une montre, quand la rotation du disque atteint la vitesse prescrite (environ 500 tours/min à la circonférence interne) et place le circuit servo de rotation dans une boucle fermée. Attention. Si cette touche est enfoncée et qu'un disque n'est pas installé, le moteur de rotation va tourner á la vitesse maximum. Si le circuit servo de la mise au point ne passe pas comme prévu dans une boucle fermée ou que la diode laser brille dans le miroir à la périphérie externe du disque, le même symptôme se produit.
❚❚	PAUSE	Ouverture/Fermeture du circuit servo de l'alignement	Le fait d'appuyer sur cette touche quand le circuit servo de la mise au point et de la rotation fonctionnent correctement en boucles fermées, place le circuit servo de l'alignement dans une boucle fermée, fait apparaître, sur le panneau avant, le numéro de la piste en cours de lecture et la durée écoulée, puis sort le signal de lecture. Si la durée écoulée n'est pas affichée ou n'est pas correctement calculée, ou si la reproduction sonore est anormale, il se peut que la diode laser s'active dans la section dépourvue de signaux enregistrés, au bord externe du disque, qu'un ajustement quelconque soit déréglé, ou qu'un autre problème se manifeste. Cette touche est de type à bascule et ouvre/ferme alternativement le circuit servo de l'alignement. Cette touche est inopérante si un disque n'est pas installé.
⏮/ ◄◄	TRACK/ MANUAL SEARCH REV	Inversion du chariot (vers l'intérieur)	Déplace le capteur vers la périphérie interne du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
►►/ ⏭	TRACK/ MANUAL SEARCH FWD	Inversion du chariot (vers l'extérieur)	Déplace le capteur vers la périphérie externe du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
■	STOP	Arrêt	Met tous les circuits servo hors service et les initialise. Le capteur reste là où il était quand cette touche a été enclenchée.
⏏	OPEN/CLOSE DISC 1	Ouverture/Fermeture	Cette touche est de type à bascule et ouvre/ferme alternativement le plateau. Le fait d'enfoncer cette touche quand le plateau est ouvert le ferme et vice versa.

[Lecture de disque en mode d'essai]

En mode d'essai, comme les circuits servo fonctionnent de manière indépendante, la lecture d'un disque exige que les touches soient enclenchées dans l'ordre prescrit, afin de fermer les circuits servo.
Voici l'ordre d'enclenchement des touches pour reproduire un disque en mode d'essai.

PGM	Allume la diode laser et ferme le circuit servo de la mise au point.
⇓	
PLAY ▶	Démarre le moteur de rotation et ferme le circuit servo de la rotation.
⇓	
PAUSE ▮▮	Ferme le circuit servo de l'alignement.

Attendre 2 à 3 secondes entre chaque opération.

1. Réglage du décalage de la mise au point

● Objectif	Règle le décalage CC de l'amplificateur d'erreur de mise au point.		
● Symptôme quand déréglé	Le lecteur ne procède plus à la mise au point et le signal RF n'est pas clair.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR).	● Etat du lecteur	Mode d'essai, arrêté (juste l'interrupteur d'alimentation commuté sur marche)
	[Réglages] 5 mV/division 10 ms/division mode CC	● Emplacement du réglage	VR103 (FCS OFS)
		● Disque	Aucun requis

[Marche à suivre]

Ajuster VR103 (FCS OFS) de façon que la tension à TP1 broche 6 (FCS ERR) soit –50 ± 50 mV.

2. Réglage du réseau de diffraction

● Objectif	Pour aligner les points du rayon laser producteur d'erreur d'alignement sur l'angle optimum de la piste		
● Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible, les pistes sont sautées.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR) via un filtre passe-bas. (Voir Figure 2) [Réglages] 50 mV/division 5 ms/division mode CC	● Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
		● Emplacement du réglage	Fente de réglage du réseau de diffraction du capteur
		● Disque	Disque de 12 cm. (Il est impossible d'employer le disque YEDS-7).

[Marche à suivre]

1. Déplacer le capteur sur le bord externe du disque par la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou la touche |◀◀ / ◀◀, de façon que la fente de réglage du réseau de diffraction se situe sur bord extérieur du disque, où elle peut être réglée.
2. Appuyer sur la touche PGM, puis sur la touche PLAY ▶, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Insérer un tournevis ordinaire dans le réseau de diffraction pour trouver le point zéro. Pour plus de détails, voir page suivante.
4. Si l'on tourne lentement le tournevis dans le sens contraire des aiguilles d'une montre à partir du point zéro, l'amplitude de l'onde augmente graduellement et si l'on continue à tourner le tournevis, l'amplitude de l'onde diminue de nouveau. Tourner le tournevis dans le sens contraire des aiguilles d'une montre à partir du point zéro et régler le réseau de diffraction au premier point où l'amplitude de l'onde atteint son maximum.

   Référence: La Figure 3 illustre la relation entre l'angle du faisceau de l'alignement et la piste et la forme d'onde.

   Remarque: L'amplitude du signal d'erreur d'alignement se situe aux environs de 3 Vc-c (quand un filtre passe-bas de 39 kΩ + 0,001 µF est utilisé). Si cette amplitude est extrêmement petite (2 Vc-c ou moins), la lentille de l'objectif risque alors de s'encrasser ou le capteur risque de mal fonctionner. Si la différence entre l'amplitude du signal d'erreur au bord le plus intérieur et au bord le plus extérieur du disque est supérieure à 10%, ceci signifie que le réseau de diffraction n'est pas réglé à son point optimum. Dans ce cas, recommencer le réglage.
5. Replacer le capteur plus ou moins à mi-chemin sur le disque par la touche TRACK/ MANUAL SEARCH REV |◀◀ / ◀◀, appuyer sur la touche PAUSE ▮▮ et vérifier que le numéro de piste et la durée écoulée sont affichés sur le panneau avant. Si ces paramètres n'apparaissent pas ce moment, ou que la durée écoulée change de manière irrégulière, vérifier le point zéro et recommencer le réglage du réseau de diffraction.

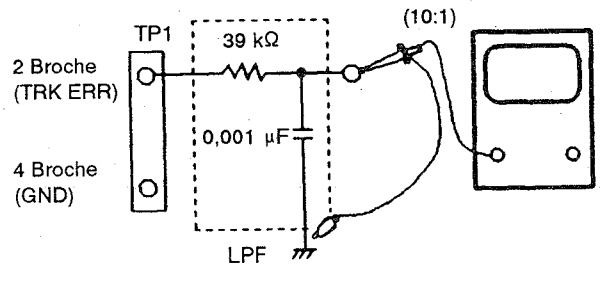
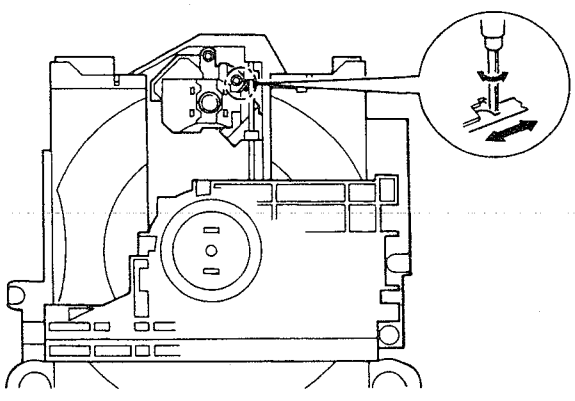


Figure 2



Emplacement des Réglages

[Repérage du point zéro]

Quand le tournevis est introduit dans la fente de réglage du réseau de diffraction et que l'angle du réseau de diffraction est modifié, l'amplitude du signal d'erreur d'alignement à TP1, broche 2, change. Dans les limites de la plage du réseau de diffraction, il existe six emplacements où l'amplitude de l'onde atteint le minimum. Mais l'enveloppe de la forme d'onde n'est régulière qu'à un seul de ces emplacements. Ce point se situe à l'endroit où les trois rayons laser, divisés par le réseau de diffraction, se situent exactement sur la même piste (voir Figure 3).
Ce point s'appelle le point zéro. Lors du réglage du réseau de diffraction, ce point zéro est repéré et utilisé comme position de référence.

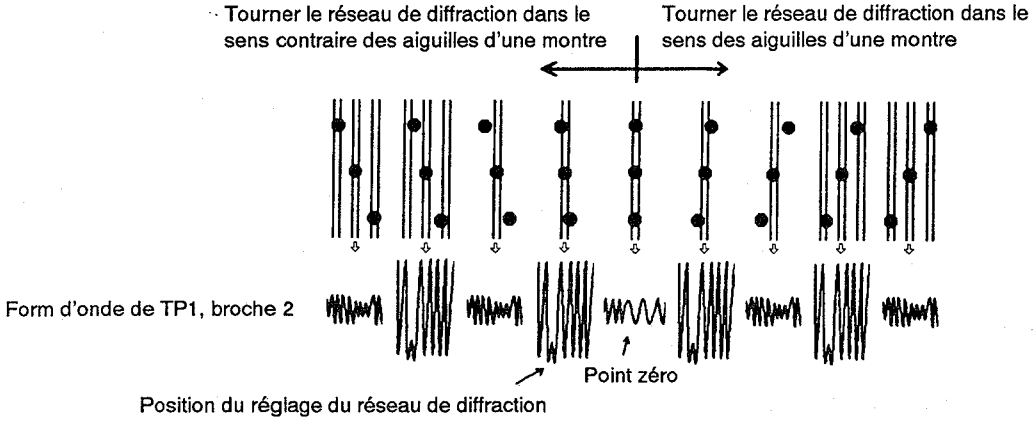
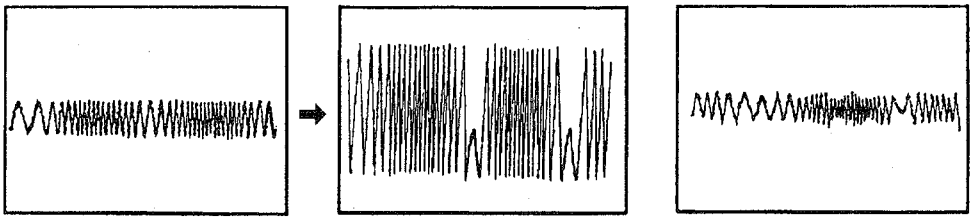

Tourner le réseau de diffraction dans le sens contraire des aiguilles d'une montre
Tourner le réseau de diffraction dans le sens des aiguilles d'une montre
Form d'onde de TP1, broche 2
Point zéro
Position du réglage du réseau de diffraction

Figure 3



Forme d'onde du point zéro

Forme d'onde d'amplitude maximum

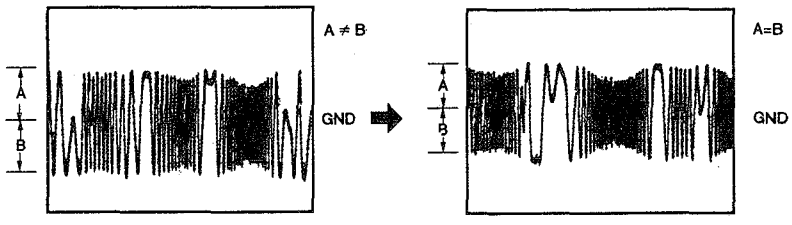
Forme d'onde autre que du point zéro

3. Réglage d'équilibrage d'erreur d'alignement

● Objectif	Pour corriger la variation de sensibilité de la photodiode d'alignement		
● Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible.		
● Raccordement des *instruments de mesure*	Raccorder l'oscilloscope à TP1, *broche 2 (TRK ERR).*	● Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
	[Réglages] 50 mV/division 5 ms/division mode CC	● Emplacement du réglage	VR102 (TRK BAL)
		● Disque	YEDS-7

[Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque (R = 35 mm) par la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou |◀◀ / ◀◀.
2. Appuyer sur la touche PGM, puis sur la touche PLAY ▶, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Aligner la ligne lumineuse (masse) au centre de l'écran de l'oscilloscope et placer celui-ci en mode CC.
4. Ajuster VR102 (TRK BAL) de façon que l'amplitude positive et l'amplitude négative du signal d'erreur d'alignement à TP1, broche 2 (TRK ERR) soient identiques (c'est-à-dire, qu'il n'y ait aucun composant CC).



S'il y a un composant CC

S'il n'y a pas de composant CC

4. Réglage d'inclinaison radiale/tangentielle du capteur

● Objectif	Pour régler l'angle du capteur par rapport au disque, de façon que les rayons laser frappent verticalement le disque et permettre ainsi la lecture optimum des signaux RF.		
● Symptôme quand déréglé	Son interrompu; certains disques peuvent être lus et pas d'autres.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF). [Réglages] 20 mV/division 200 ns/division mode CA	● Etat du lecteur	Mode d'essai, lecture
		● Emplacement du réglage	Vis de réglage d'inclinaison radiale Vis de réglage d'inclinaison tangentielle
		● Disque	Disque de 12 cm. (Il est impossible d'employer le disque YEDS-7).

[Marche à suivre]

1. Déplacer le capteur sur le bord externe du disque par la touche TRACK/ MANUAL SEARCH FWD ▶▶ /▶▶| ou |◀◀ /◀◀, de façon que les vis de réglage d'inclinaison radiale et tangentielle puissent être réglées.

   Appuyer sur la touche PGM, PLAY ▶ et PAUSE ▮▮ dans cet ordre, afin de fermer le circuit servo de la mise au point, puis celui de la rotation et placer le lecteur en mode de lecture.

2. D'abord, ajuster la vis d'inclinaison radiale à l'aide d'une clé hexagonale M de 3 mm, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible.

3. Ensuite, ajuster la vis d'inclinaison tangentielle à l'aide d'une clé hexagonale M de 3 mm, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible (Figure 5).

4. Ajuster de nouvear la vis d'inclinaison radiale et la vis d'inclinaison tangentielle de façon que le motif en oeil soit le plus clairement visible. Le cas échéant, régler les deux vis de façon que le motif en oeil soit le plus clairement visible.

   Remarque: "Radial" et "tangentiel" se rapportent aux sens par rapport au disque illustré à la Figure 4.

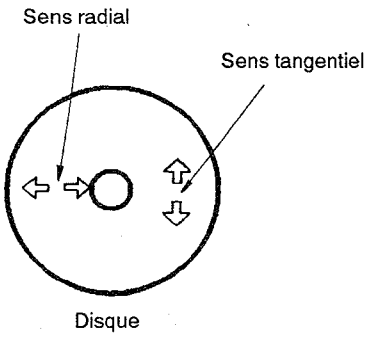
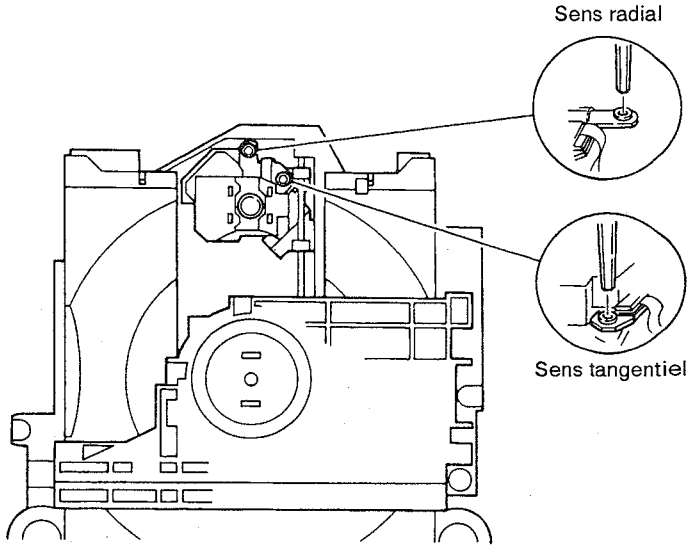


Figure 4



Emplacements des Réglages

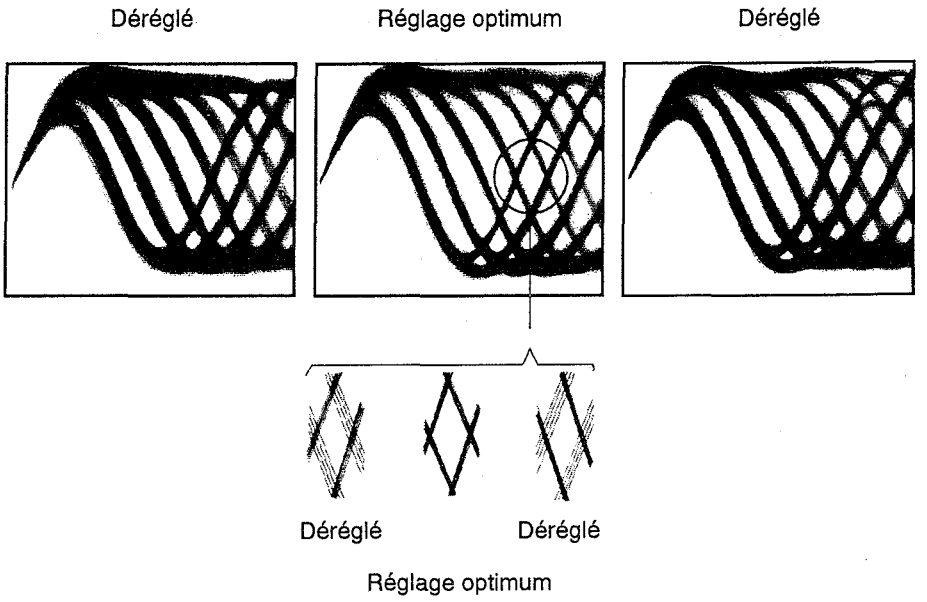


Figure 5 Motif en oeil

5. Réglage du niveau RF (niveau RF)

● Objectif	Pour optimaliser l'amplitude du signal RF de lecture		
● Symptôme quand déréglé	Pas de lecture ni de recherche		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF) [Rélages] 50 mV/division 10 ms/division mode CA	● Etat du lecteur	Mode d'essai, lecture
		● Emplacement du réglage	VR1 (alimentation du laser)
		● Disque	YEDS-7

[Marche à suivre]

1. Placer le capteur à mi-chemin sur le disque (R = 35 mm) à l'aide de la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou |◀◀ / ◀◀. Ensuite, appuyer sur la touche PGM puis sur la touche PLAY ▶, dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecteur.
2. Ajuster VR1 (alimentation du laser) de façon que l'amplitude du signal RF atteigne 1,2 Vc-c ± 0,1V.

6. Réglage de gain de boucle asservie de la mise au point

● Objectif	Pour optimaliser le gain de la boucle d'asservissement de la mise au point.		
● Symptôme quand déréglé	La lecture ne commence pas ou l'actuateur de la mise au point est parasité.		
● Raccordement des instruments de mesure	Voir Figure 6 [Réglages] CAN. 1 CAN. 2 20 mV/division 5 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR152 (FCS GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou la touche |◀◀ / ◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PGM, la touche PLAY ▶, puis sur la touche PAUSE ▮▮, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR152 (FSC GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

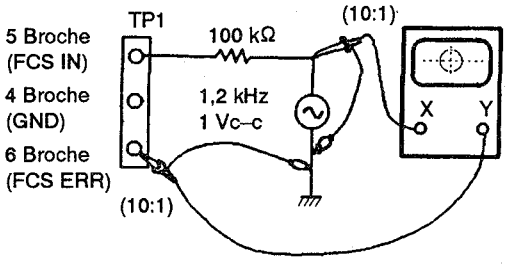
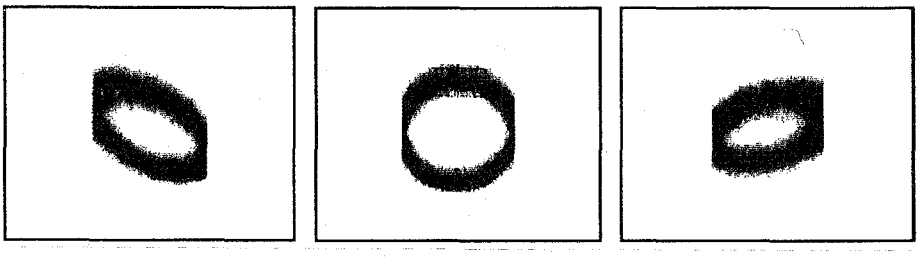


Figure 6

Adjustment de gain de mise au point



Gain supérieur | Gain optimum | Gain inférieur

7. Réglage de gain de boucle asservie de l'alignement

● Objectif	Pour optimaliser le gain de la boucle d'asservissement de l'alignement.		
● Symptôme quand déréglé	La lecture ne commence pas, l'actuateur est parasité pendant la recherche, ou des pistes sont sautées.		
● Raccordement des instruments de mesure	Voir Figure 7 [Réglages] CAN. 1 CAN. 2 50 mV/division 50 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR151 (TRK GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou la touche |◀◀ / ◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PGM, la touche PLAY ▶, puis sur la touche PAUSE ▮▮, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR151 (TRK GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

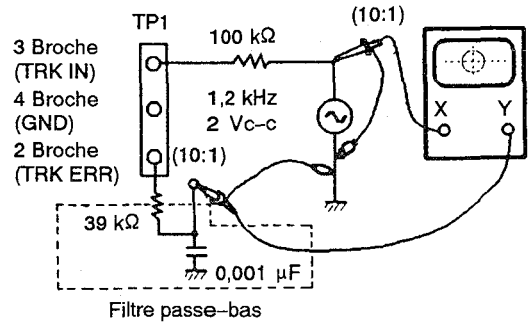
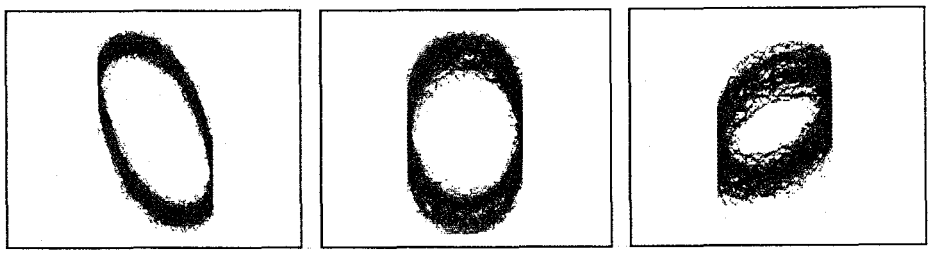


Figure 7

Adjustment de gain d'alignement



Gain supérieur | Gain optimum | Gain inférieur

8. Vérification du signal d'erreur de la mise au point

● Objectif ● Symptôme quand déréglé	Pour juger si le capteur est bon ou pas, en observant le signal d'erreur de la mise au point. L'état du capteur s'évalue à partir de l'amplitude du signal d'erreur d'alignement (comme décrit dans le paragraphe relatif à l'équilibrage d'erreur d'alignement), ainsi qu'à partir de la forme d'onde du signal d'erreur de mise au point.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR). [Réglages] 100 mV/division 5 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode de test, arrêt Aucun YEDS-7

[Marche à suivre]

1. Raccorder TP1, broche 5 à la masse.
2. Installer le disque.
3. Tout en regardant l'écran de l'oscilloscope, appuyer sur la touche PGM et observer la forme d'onde de la Figure 8, pendant quelques instants.Vérifier que l'amplitude atteint au moins 2,5 Vc-c et que les amplitudes positive et négatives soient égales. Comme la forme ne sort que pour un moment, quand la touche PGM est enclenchée, appuyer sur à plusieurs reprises sur cette touche, jusqu'à ce que la forme d'onde ait été vérifiée.

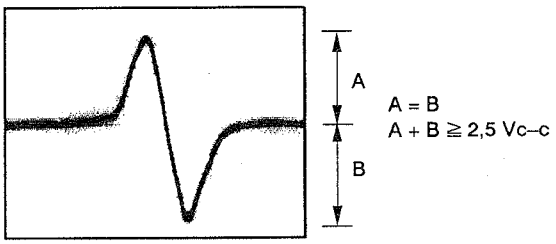


Figure 8

[Evaluation du capteur]

Ne pas tenter d'évaluer l'état du capteur tant que tous les réglages ne sont pas corrects. Les cas suivants témoignent de l'anomalie du capteur.

1. L'amplitude du signal d'erreur d'alignement est extrêmement petite (inférieure à 2 Vc-c).
2. L'amplitude du signal d'erreur de mise au point est extrêmement petite (inférieure à 2,5 Vc-c).
3. Les amplitudes positive et négative du signal d'erreur de mise au point sont extrêmement asymétriques (taux 2:1 ou plus).
4. Le signal RF est trop petit (inférieur à 0,8 Vc-c) et même si VR1 (alimentation du laser) est ajustée, le signal RF ne peut être élevé au niveau standard.

8. AJUSTE

1. Métodos de ajuste

Si un reproductor de discos compactos se ajusta incorrecta o inadecuadamente, puede funcionar mal o no trabajar incluso aunque no exista ningún problema en el captor ni en los circuitos. Ajuste correctamente siguiendo el procedimiento de ajuste.

1-1 Ítemes de ajuste/verificación y orden

Paso	Ítem	Punto de prueba	Lugar de ajuste
1	Ajuste del descentramiento de enfoque	TP1, Patilla 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Ajuste de retícula	TP1, Patilla 2 (TRK. ERR)	Ranura de ajuste de retícula
3	Ajuste del equilibrio de ajuste de seguimiento	TP1, Patilla 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Ajuste de la inclinación en sentido radial/tangencial del captor	TP1, Patilla 1 (RF)	Tornillo de ajuste de la inclinación radial Tornillo de ajuste de la inclinación tangencial
5	Ajuste del nivel de RF	TP1, Patilla 1 (RF)	VR1 (Nivel de RF)
6	Ajuste de la ganancia del bucle del servo de enfoque	TP1, Patilla 5 (FCS. IN) TP1, Patilla 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Ajuste de la ganancia del bucle del servo de seguimiento	TP1, Patilla 3 (TRK. IN)) TP1, Patilla 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Verificación de la señal de error de enfoque	TP1, Patilla 6 (FCS. ERR)	———

● **Tabla de abreviaturas**

FCS. ERR : Error de enfoque
FCS. OFS : Descentramiento de enfoque
TRK. ERR : Error de seguimiento
TRK. BAL : Equilibrio de seguimiento
FCS. IN : Entrada de enfoque
TRK. IN : Entrada de seguimiento

1-2 Instrumentos y herramientas de medición

1. Osciloscopio de doble traza (Sonda de 10:1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Disco de 12 cm (con 70 minutos de grabación por lo menos)
   Para el tipo de reproducción múltiple de disco compacto, emplee solamente el disco de prueba YEDS-7.
5. Filtro de paso bajo (39 kΩ + 0,001 μF)
6. Resistor (100 kΩ)
7. Llave hexagonal (M3 mm)
8. Herramientas estándar

1-3 Ubicación de los puntos de prueba y los resistores variables de ajuste

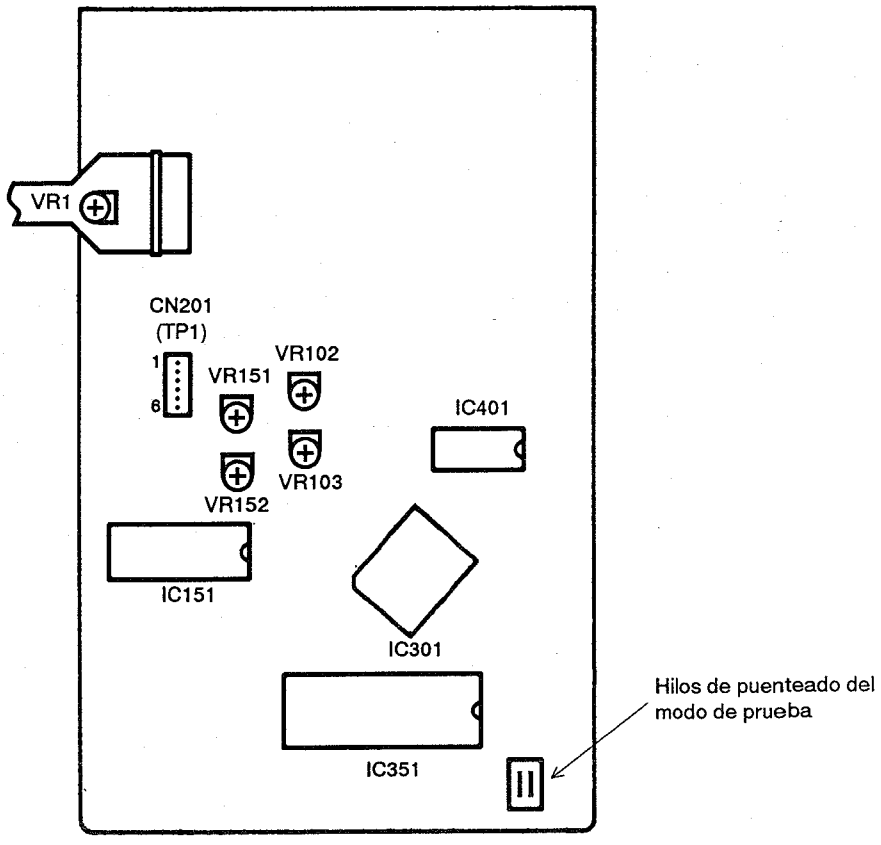


Figura 1 Lugares de Ajuste

1-4 Notas

1. Emplee una sonda de 10:1 para el osciloscopio.
2. Todas las posiciones de los mandos (ajustes) para el osciloscopio de los procedimientos de ajuste son para cuando se emplee la sonda de 10:1.

1-5 Modo de prueba

Estos modelos poseen un modo de prueba que permite realizar fácilmente los ajustes y las comprobaciones requeridos para el servicio. Cuando estos modelos estén en el modo de prueba, las teclas del panel frontal trabajarán de forma diferente a la normal. Los ajustes y las comprobaciones podrán realizarse accionando estas teclas de acuerdo con el procedimiento correcto. Para estos modelos, todos los ajustes se realizarán en el modo de prueba.

[Puesta de estos modelos en el modo de prueba]

A continuación se indica cómo poner estos modelos en el modo de prueba.
1. Ponga en OFF el interruptor de alimentación.
2. Cortocircuite los hilos de puenteado de modo de prueba. (Consulte la figura 1.)
3. Ponga en ON el interruptor de alimentación.

Cuando haya ajustado correctamente el modo de prueba, la visualización será diferente a la obtenida normalmente al conectar la alimentación. Si la visualización sigue siendo la normal, el modo de prueba no se habrá ajustado normalmente, por lo que tendrá que repetir los pasos 1 a 3.

[Desactivación del modo de prueba]

A continuación se indica el procedimiento para desactivar el modo de prueba.

1. Presione la tecla STOP y cese todas las operaciones.
2. Ponga en OFF el interruptor de alimentación del panel frontal.

[Operaciones de teclas en el modo de prueba]

Código	Nombre de la tecla	Función en el modo de prueba	Explicación
	PGM (PROGRAMA)	Cierre del servo de enfoque	Si la bandeja de disco 1 está cerrada, ésta se moverá hasta la posición de reproducción. Después el diodo láser se encenderá y el actuador de enfoque descenderá, después se elevará lentamente, y el servo de enfoque se cerrará en el punto en el que el objetivo se enfoque sobre el disco. Con el reproductor en este estado, si gira ligeramente con la mano el disco parado podrá oír el sonido del servo de enfoque. Si puede oír este sonido, el servo de enfoque estará funcionando correctamente. Si presiona esta tecla sin disco montado, el diodo láser se encenderá, el actuador de enfoque se verá empujado hacia abajo, y después se levantará y descenderá dos veces, y volverá a su posición original.
►	PLAY	Activación del servo del eje	Pondrá en marcha el motor del eje haciéndolo girar hacia la derecha y después la rotación del disco alcanzará la velocidad prescrita (unas 500 rpm en la periferia interior), y pondrá el servo del eje en un bucle cerrado. Tenga cuidado. Si presiona esta tecla cuando no haya disco montado, el motor del eje girará a la velocidad máxima. Si el servo de enfoque no pasa correctamente a un bucle cerrado, o si el haz lasérico incide en la sección del espejo en el la periferia del disco, ocurrirá el mismo síntoma.
▮▮	PAUSE	Apertura/cierre del servo de seguimiento	Si presiona esta tecla cuando el servo de enfoque y el servo del eje están funcionando correctamente en bucles cerrados, el servo de sequimiento se pondrá en bucle cerrado, en el panel frontal se visualizarán el número de canción que esté reproduciéndose y el tiempo transcurrido, y se producirá la salida de la señal de reproducción. Si el tiempo transcurrido no se visualiza o no se cuenta correctamente, o si el sonido no se reproduce correctamente, es posible que el rayo lasérico esté incidiendo en la sección sin sonido grabado en el borde exterior del disco, o que exista algún otro problema. Esta tecla es basculante (de acción alternativa) y abre/cierra el servo de seguimiento alternativamente. Esta tecla no funcionará cuando no haya disco montado.
⏮/ ◄◄	TRACK/ MANUAL SEARCH REV	Retroceso del carro (hacia adentro)	Moverá la posición del captor hacia el diámetro interior del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
►►/ ⏭	TRACK/ MANUAL SEARCH FWD	Avance del carro (hacia afuera)	Moverá la posición del captor hacia la periferia del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
■	STOP	Parada	Desactivará todos los servos e inicializará la unidad. El captor permanecerá donde estaba cuando se presionó esta tecla.
▲	OPEN/CLOSE DISC1	Apertura/cierre de la bandeja del disco	Abrirá/cerrará la bandeja del disco. Esta tecla es basculante (de acción alternativa) y abre/cierra la bandeja alternativamente.

[Cómo reproducir un disco en el modo de prueba]

En el modo de prueba, como los servos funcionan independientemente, la reproducción de un disco requiere el que usted emplee las teclas en el orden correcto para cerrar los servos.
A continuación se indica la secuencia de operación de teclas para reproducir un disco en el modo de prueba.

PGM	Hará que se encienda el diodo láser y cerrará el servo de enfoque.
⇓	
PLAY ▶	Pondrá en marcha el motor del eje y hará que se cierre el servo del eje.
⇓	
PAUSE ▮▮	Cerrará el servo de seguimiento.

Espere de 2 a 3 segundos por lo menos entre cada una de estas operaciones.

1. Ajuste del descentramiento del enfoque

<table>
<tr><td>● Objetivo

● Síntomas en caso de desajuste</td><td colspan="3">Ajuste de la tensión de CC para el amplificador de error de enfoque.

El reproductor no enfoca y la señal de RF contiene perturbaciones.</td></tr>
<tr><td>● Conexión de los instrumentos de medición</td><td>Conecte el osciloscopio a TP1, patilla 6, (FCS ERR).

[Ajustes] 5 mV/división
10 ms/división
modo de CC</td><td>● Estado del reproductor

● Lugar de ajuste

● Disco</td><td>Modo de prueba, parado (con el interruptor de alimentación en ON)

VR103 (FCS OFS)

No es necesario</td></tr>
<tr><td colspan="4">[Procedimiento]

Ajuste VR103 (FCS OFS) de forma que la tensión de CC de TP1, patilla 6, (FCS ERR) sea de –50 ± 50 mV.</td></tr>
</table>

2. Ajuste de retícula

● Objetivo	Alineación de los puntos del haz lasérico de generación de error de seguimiento al ángulo óptimo en la pista		
● Síntomas en caso de desajuste	La reproducción no se inicia, la búsqueda de canciones es imposible, las pistas se saltan.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR) a través de un filtro de paso bajo. (Consulte la figura 2) [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto Ranura de ajuste de retícula del captor Disco de 12 cm. (El disco YEDS-7 no podrá emplearse.)

[Procedimiento]

1. Mueva el captor hasta el borde exterior del disco con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀ de forma que la ranura de ajuste de la retícula quede en el borde exterior del disco, donde puede ajustarse.
2. Presione la tecla PGM, y después la tecla PLAY ▶, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Inserte un destornillador normal en la ranura de ajuste de la retícula y ajuste la retícula hasta encontrar el punto nulo.
   Para más detalles, consulte la página siguiente.
4. Si gira lentamente el destornillador hacia la izquierda desde el punto nulo, la amplitud de la onda aumentará gradualmente. Después, si continúa girando el destornillador, la amplitud de la onda se volverá otra vez más pequeña. Gire el destornillador hacia la izquierda desde el punto nulo y ajuste la retícula al primer punto en el que la amplitud de la onda alcance su valor máximo.

   Referencia: En la figura 3 se muestra la relación entre el ángulo del haz de seguimiento con la pista y la forma de onda.

   Nota: La amplitud de la señal de error de seguimiento será de aproximadamente 3 Vp-p (cuando se emplee un filtro de paso bajo de 39 kΩ , 0,001 µF). Si esta amplitud es extremadamente pequeña (2 Vp-p o menos), es posible que el objetivo esté sucio o que el captor esté funcionando mal. Si la diferencia entre la amplitud de la señal de error en el borde interior y exterior del disco es superior al 10%, la retícula no estará ajustada al punto óptimo, por lo que tendrá que volver a ajustarla.
5. Devuelva el captor hasta la mitad más o menos del disco con la tecla TRACK/MANUAL SEARCH REV |◀◀ / ◀◀, presione la tecla PAUSE ▮▮, y vuelva a comprobar si en el panel frontal se visualizan el número de canción y el tiempo transcurrido. Si no se visualizan esta vez, o si el tiempo transcurrido cambia irregularmente, vuelva a comprobar el punto nulo y ajuste otra vez la retícula.

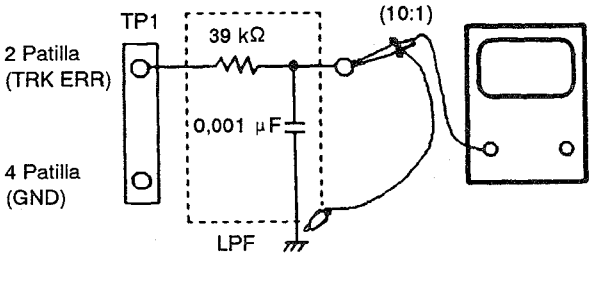
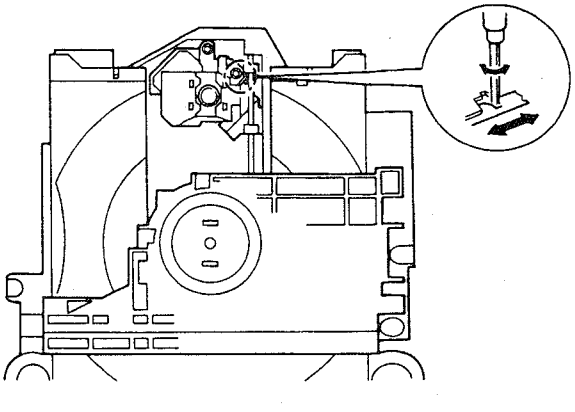


Figura 2



Lugares de Ajuste

[Cómo encontrar el punto nulo]

Cuando inserte el destornillador normal en la ranura para el ajuste de la retícula y cambie el ángulo de la misma. La amplitud de la señal de error de seguimiento de TP1, patilla 2, cambiará. Dentro del margen para la retícula existen cinco o seis lugares en los que la amplitud alcanza el valor mínimo. De estos cinco o seis lugares, solamente hay uno en el que la envolvente de la forma de onda es uniforme. Este lugar es donde los tres haces lasércicos divididos por la retícula se encuentran exactamente sobre la misma pista. (Consulte la figura 3.) Este punto se denomina punto nulo. Cuando ajuste la retícula, este punto se encontrará y empleará como posición de referencia.

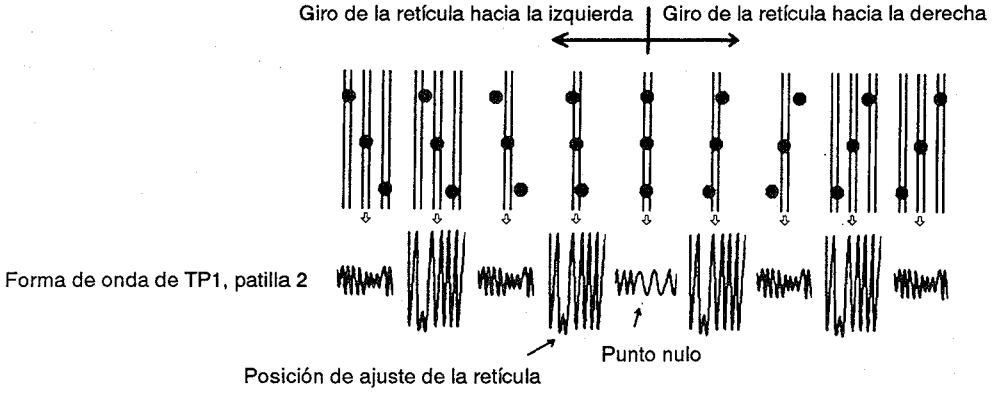
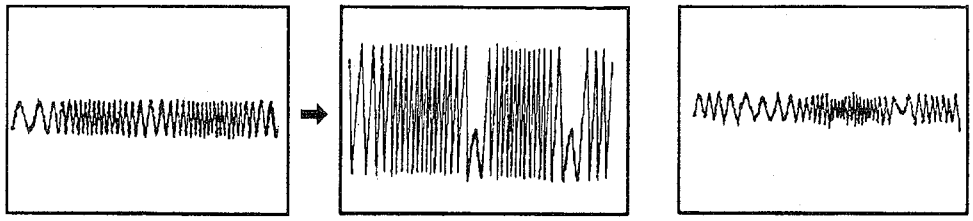

Giro de la retícula hacia la izquierda
Giro de la retícula hacia la derecha
Forma de onda de TP1, patilla 2
Punto nulo
Posición de ajuste de la retícula

Figura 3



Forma de onda del punto nulo

Forma de onda de amplitud máxima

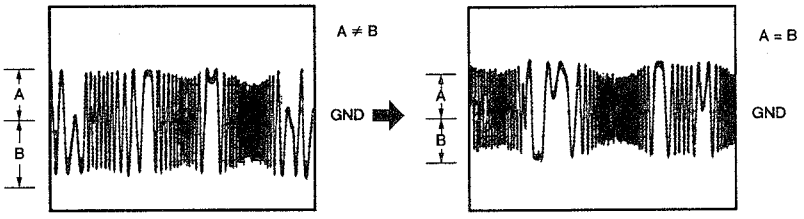
Forma de onda que no es el punto nulo

3. Ajuste del equilibrio de error de seguimiento

● Objetivo	Corrección de la variación de la sensibilidad del fotodiodo de seguimiento		
● Síntomas en caso de desajuste	La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR). Esta conexión puede realizarse a través de un filtro de paso bajo. [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto VR102 (TRK BAL) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK/MANUAL SEARCH FWD ▶▶/▶▶| o |◀◀/◀◀.
2. Presione la tecla PGM, y después la tecla PLAY ▶, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Haga coincidir la línea brillante (masa) del centro de la pantalla del osciloscopio y ponga éste en el modo de CC.
4. Ajuste VR102 (TRK BAL) de forma que la amplitud positiva y la negativa de la señal de error de seguimiento de TP1, patilla 2, (TRK ERR) sean iguales (en otras palabras, de forma que no haya componente de CC).



Cuando hay componente de CC

Cuando no hay componente de CC

4. Ajuste de la inclinación en sentido radial/tangencial del captor

● Objetivo	Ajustar el ángulo del captor en relación con el disco de forma que los haces lasércicos incidan perpendicularmente sobre el mismo a fin de poder leer con la mayor exactitud las señales de RF.		
● Síntomas en caso de desajuste	Sonido quebrado, algunos discos pueden reproducirse pero otros no.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 20 mV/división 200 ns/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción Tornillo de ajuste de la inclinación radial y tornillo de ajuste de la inclinación tangencial Disco de 12 cm. (El disco YEDS-7 no podrá emplearse.)

[Procedimiento]

1. Mueva el captor hasta el borde exterior del disco con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀ de forma que puedan ajustarse los tornillos de inclinación radial/tangencial.
   Presione la tecla PGM, la tecla PLAY ▶, y después la tecla PAUSE ❚❚, por este orden, a fin de cerrar el servo de enfoque, después el servo del eje, y por último para poner el reproductor en el modo de reproducción.
2. En primer lugar, gire el tornillo de ajuste de inclinación radial con una llave hexagonal M 3 mm hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad.
3. A continuación, ajuste el tornillo de ajuste de inclinación tangencial con una llave hexagonal M 3 mm hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad (figura 5).
4. Vuelva a girar el tornillo de ajuste de inclinación radial y el tornillo de inclinación tangencial hasta que el patrón ocular pueda verse con la mayor claridad. Si es necesario, ajuste alternativamente los dos tornillos hasta que el patrón ocular pueda verse con la mayor claridad.

Nota: Radial y tangencial significan las direcciones en relación con el disco mostrado en la figura 4.

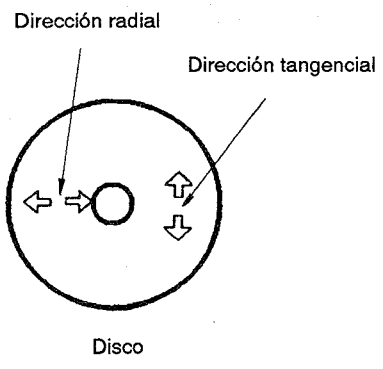
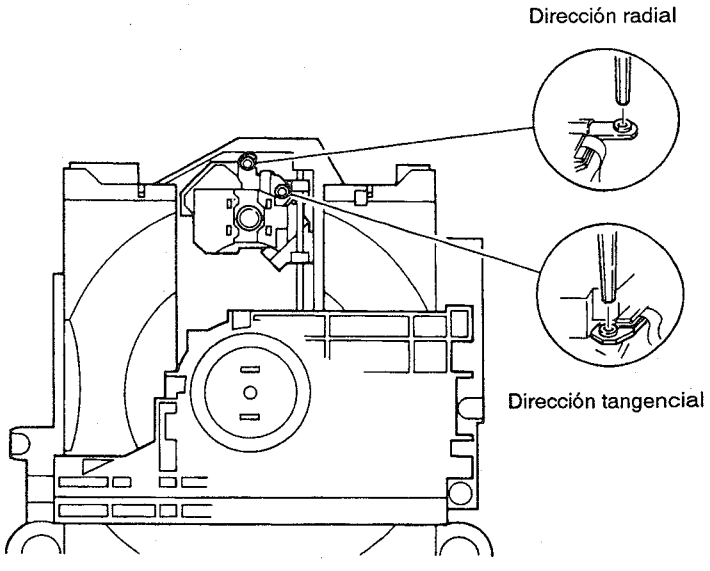


Figura 4



Lugares de Ajuste

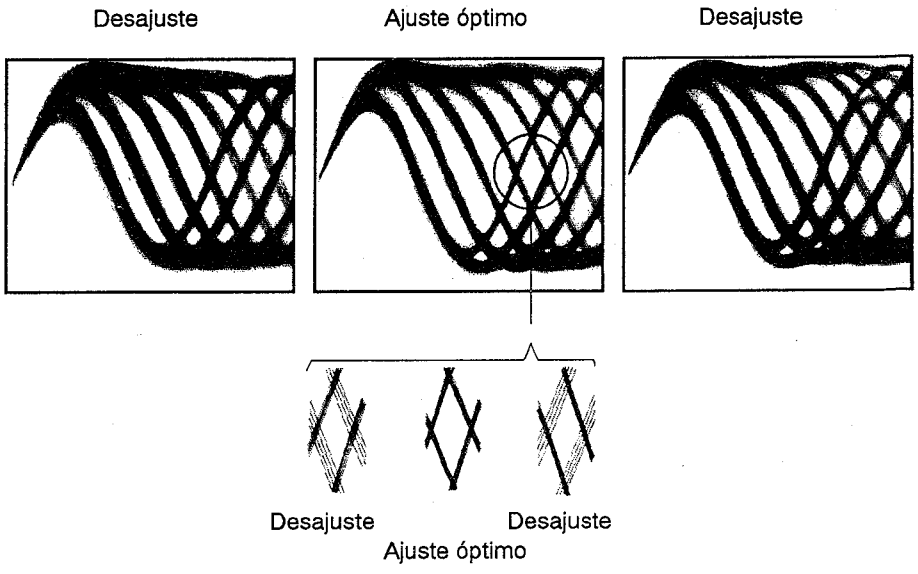


Figura 5 Patron Optico

5. Ajuste del nivel de RF

● Objetivo ● Síntomas en caso de desajuste	Optimización de la amplitud de la señal de RF de reproducción La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 50 mV/división 10 ms/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR1 (potencia de láser) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀, presione la tecla PGM, depués la tecla PLAY ▶, por este orden a fin de cerrar los servos respectivos, y ponga el reproductor en el mode de reproducción.
2. Ajuste VR1 (potencia de láser) de forma que la amplitud de la señal de RF sea de 1,2 Vp-p ± 0,1 V.

6. Ajuste de la ganancia del bucle del servo de enfoque

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de enfoque La reproducción no se inicia o el actuador de enfoque produce ruido.		
● Conexión de los instrumentos de medición	Consulte la figura 6. [Ajustes] CH1 CH2 20 mV/división 5 mV/división Modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR152 (FCS GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. *Presione la tecla* TRACK/MANUAL SEARCH FWD ▶▶/▶▶| o |◀◀/◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PGM, la tecla PLAY ▶, y después la tecla PAUSE ▮▮, por este orden, a fin de cerrar los servos correspondientes y poner el reproductor en el modo de reproducción.
3. Ajuste VR152 (FCS GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

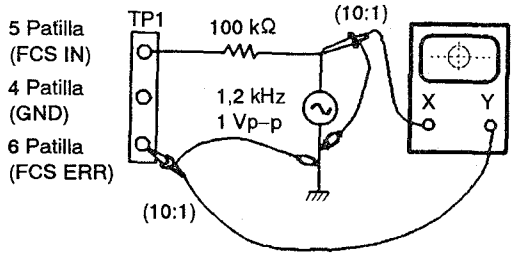
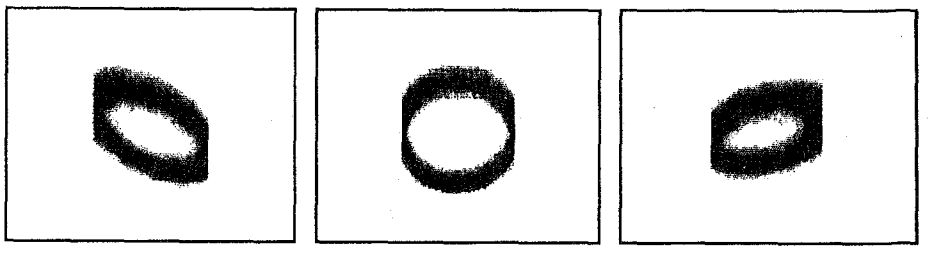


Figura 6

Ajuste de la ganancia de enfoque



Ganancia superior Ganancia óptima Ganancia inferior

7. Ajuste de la ganancia del bucle del servo de seguimiento

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de seguimiento La reproducción no se inicia, el actuador de enfoque produce ruido, o se saltan pistas.		
● Conexión de los instrumentos de medición	Consulte la figura 7. [Ajustes] CH1 CH2 50 mV/división 50 mV/división Modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR151 (TRK GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PGM, la tecla PLAY ▶, y la tecla PAUSE ❚❚, por este orden, a fin de cerrar los servos respectivos y poner el reproductor en el modo de reproducción.
3. Ajuste VR151 (TRK GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

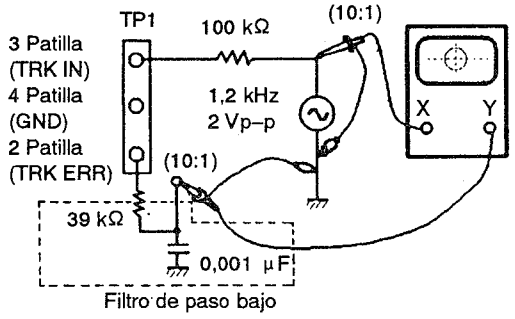
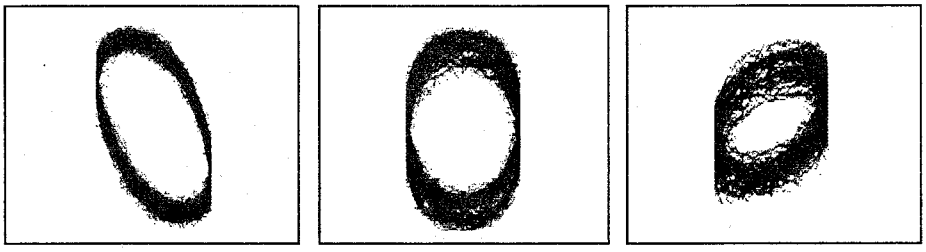


Figura 7

Ajuste de la ganancia de seguimiento



Ganancia superior | Ganancia óptima | Ganancia inferior

8. Verificación de la señal de error de enfoque (curva S de enfoque)

<table>
<tr><td>● Objetivo

● Síntomas en caso de desajuste</td><td colspan="3">Juzgar si el captor est'a bien o no observando la señal de error de enfoque. El captor se juzga por la amplitud de la señal de error de seguimiento (como se ha indicado en la sección sobre el ajuste del equilibrio de error de seguimiento) y la forma de onda de la señal de error de enfoque.</td></tr>
<tr><td>● Conexión de los instrumentos de medición</td><td>Conecte el osciloscopio a TP1, patilla 6, (FCS ERR).

[Ajustes] 100 mV/división
5 ms/división
modo de CC</td><td>● Estado del reproductor

● Lugar de ajuste

● Disco</td><td>Modo de prueba, parada

Ninguno

YEDS-7</td></tr>
</table>

[Procedimiento]

1. Conecte TP1, patilla 5, a masa.
2. Coloque el disco.
3. Contemplando la pantalla del osciloscopio, presione la tecla PGM y observe durante un momento la forma de onda de la figura 8. Verifique si la amplitud es de 2,5 Vp-p por lo menos y si la amplitud de las partes positiva y negativa son iguales. Como la forma de onda solamente sale durante un momento cuando se presiona la tecla PGM, presione una y otra vez esta tecla hasta que logre comprobar la forma de onda.

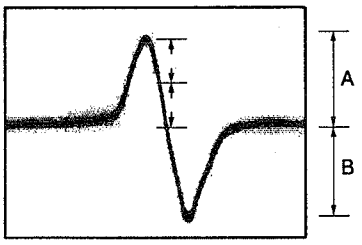


Figura 8

[Juicio sobre el captor]

No juzgue el captor hasta haber finalizado correctamente todos los ajustes. En los casos siguientes es posible que haya algo erróneo en el captor.

1. La amplitud de la señal de error de seguimiento es extremadamente pequeña (menos de 2 Vp-p).
2. La amplitud de la señal de error de enfoque es extremadamente pequeña (menos de 2,5 Vp-p).
3. Las amplitudes de las partes positiva y negaiva de la señal de error de enfoque son extremadamente asimétricas (relación de 2:1 o superior).
4. La señal de RF es demasiado pequeña (menos de 0,8 Vp-p) y aunque se ajuste VR1 (potencia de láser), la señal de RF no puede aumentarse hasta el nivel estándar.

9. IC INFORMATION (TC9237N)

● TC9237N (DIGITAL FILTER & D/A CONVERTER)

Pin Function

Pin No.	Pin Name	I/O	Function	Remarks
1	M/L	I	MSB First/LSB First select terminal for input data "H" : MSB First, "L" : LSB First	Pull-up
2	MUTE	I	Muting terminal "H" : mutes output signal	
3	AT	I	Normally "H"	
4	VDA	–	Power input for DA converter (R channel)	
5	RO	O	R channel data output terminal	
6	$\overline{RO}$	O	R channel data output terminal	
7	GNDA	–	Ground terminal for DA converter (R channel)	
8	GNDA	–	Ground terminal for DA converter (L channel)	
9	$\overline{LO}$	O	L channel data output terminal	
10	LO	O	L channel data output terminal	
11	VDA	–	Power input for DA converter (L channel)	
12	C	I	Fix to "L".	
13	TEST	I	Test terminal Normally "H" or open	Pull-up
14	GND	–	Ground terminal for logic section	
15	GNDX	–	Ground terminal for oscillator output section	
16	XI	I	Crystal oscillator input Generates clock necessary for the system. 384fs	
17	XO	O		
18	VDX	–	Power input for oscillator output	
19	MCK	O	System clock output terminal 384fs	
20	EM1	I	44.1 kHz/32 kHz/48 kHz mode select terminal for deemphasis filter EM1: L, L, H, H EM2: L, H, H, L Mode: 44.1 kHz, 32 kHz, 48 kHz	
21	EM2	I		
22	R/L	I	R/L select terminal "H" : LRCK signal ("H" : R channel data input, "L" : L channel data input) "L" : LRCK signal ("H" : L channel data input, "L" : R channel data input)	Pull-up
23	EMP	I	Deemphasis filter ON/OFF select terminal "H" : ON, "L" : OFF	
24	$\overline{HS}$	I	Normal/high speed select terminal "H" : normal operation, "L" : high speed	
25	DATA	I	Data input terminal	
26	BCK	I	Bit clock input terminal	
27	LRCK	I	LR clock input terminal	
28	VDD	–	Power input for logic section	

10. FOR PD–Z74T/HEMXJ, HB, HBXJ, SD, HPW AND PD–Z570T/SD TYPES

CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the impotance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

10.1 FOR PD–Z74T/HEMXJ, HB, HBXJ, SD AND HPW TYPES

The PD–Z74T/HEMXJ, HB, HBXJ, SD and HPW types are the same as the PD–Z74T/HEM type with the exception of the following section.

Mark	Symbol & Description	Part No.						Remarks
		PD–Z74T/ HEM type	PD–Z74T/ HEMXJ type	PD–Z74T/ HB type	PD–Z74T/ HBXJ type	PD–Z74T/ SD type	PD–Z74T/ HPW type	
⊙	MOTHER BOARD ASSEMBLY	PWM1350	PWM1347	PWM1350	PWM1347	PWM1348	PWM1350	
⚠	AC power cord	PDG1008	PDG1008	PDG1021	PDG1021	RDG1003	PDG1011	
⚠	Power transformer (AC220/240V)	PTT1125	PTT1125	PTT1125	PTT1125	.....	PTT1125	
⚠	Power transformer (AC110/120–127/220/240V)	.....	.....	.....	.....	PTT1126	.....	
⚠	Voltage selector	.....	.....	.....	.....	PSB1002	.....	
	Operating instructions (English, French, German, Italian, Dutch, Spanish, Portuguese, Swedish)	PRE1136	PRE1136	.....	.....	.....	.....	
	Operating instructions (English)	.....	.....	PRB1135	PRB1135	PRB1135	PRB1135	
	Operating instructions (Spanish)	.....	.....	.....	.....	PRC1021	.....	
	Packing case	PHG1578	PHG1590	PHG1578	PHG1590	PHG1578	PHG1578	

⊙ MOTHER BOARD ASSEMBLY (PWM1347 and PWM1348)

The mother board assemblies (PWM1347) and (PWM1348) are the same as the mother board assembly (PWM1350) with the exception of the following section.

Mark	Symbol & Description	Part No.			Remarks
		PWM1350	PWM1347	PWM1348	
	IC351	PD4305B	PD4309A	PD4305B	
	VR102, VR151, VR152	RCP1046	VRTB6VS223	VRTB6VS223	
	VR103	RCP1044	VRTB6VS102	VRTB6VS102	

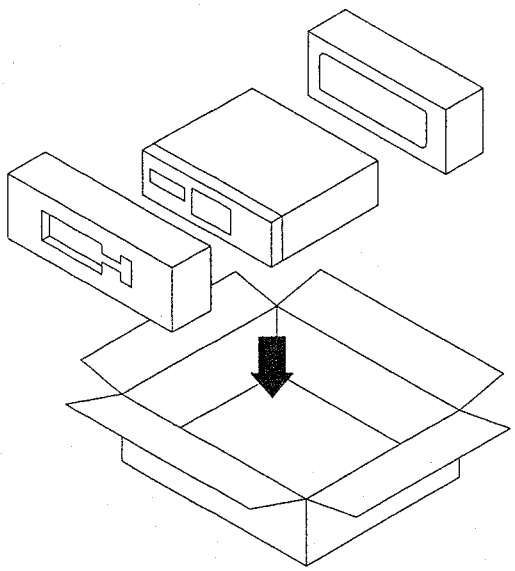
10.2 FOR PD–Z570T/SD TYPE

The PD–Z570T/SD type is the same as the PD–Z570T/HEM type with the exception of the following section.

Mark	Symbol & Description	Part No.		Remarks
		PD–Z570T/ HEM type	PD–Z570T/ SD type	
⊙	MOTHER BOARD ASSEMBLY	PWM1345	PWM1346	
⚠	AC power cord	PDG1008	RDG1003	
⚠	Power transformer	PTT1125	.....	
⚠	Power transformer	.....	PTT1126	
⚠	Voltage selector	.....	PSB1002	
	Operating instructions (English, French, German, Italian, Dutch, Spanish, Portuguese, Swedish)	PRE1139	.....	
	Operating instructions (English)	.....	PRB1147	
	Operating instructions (Spanish)	.....	PRC1021	

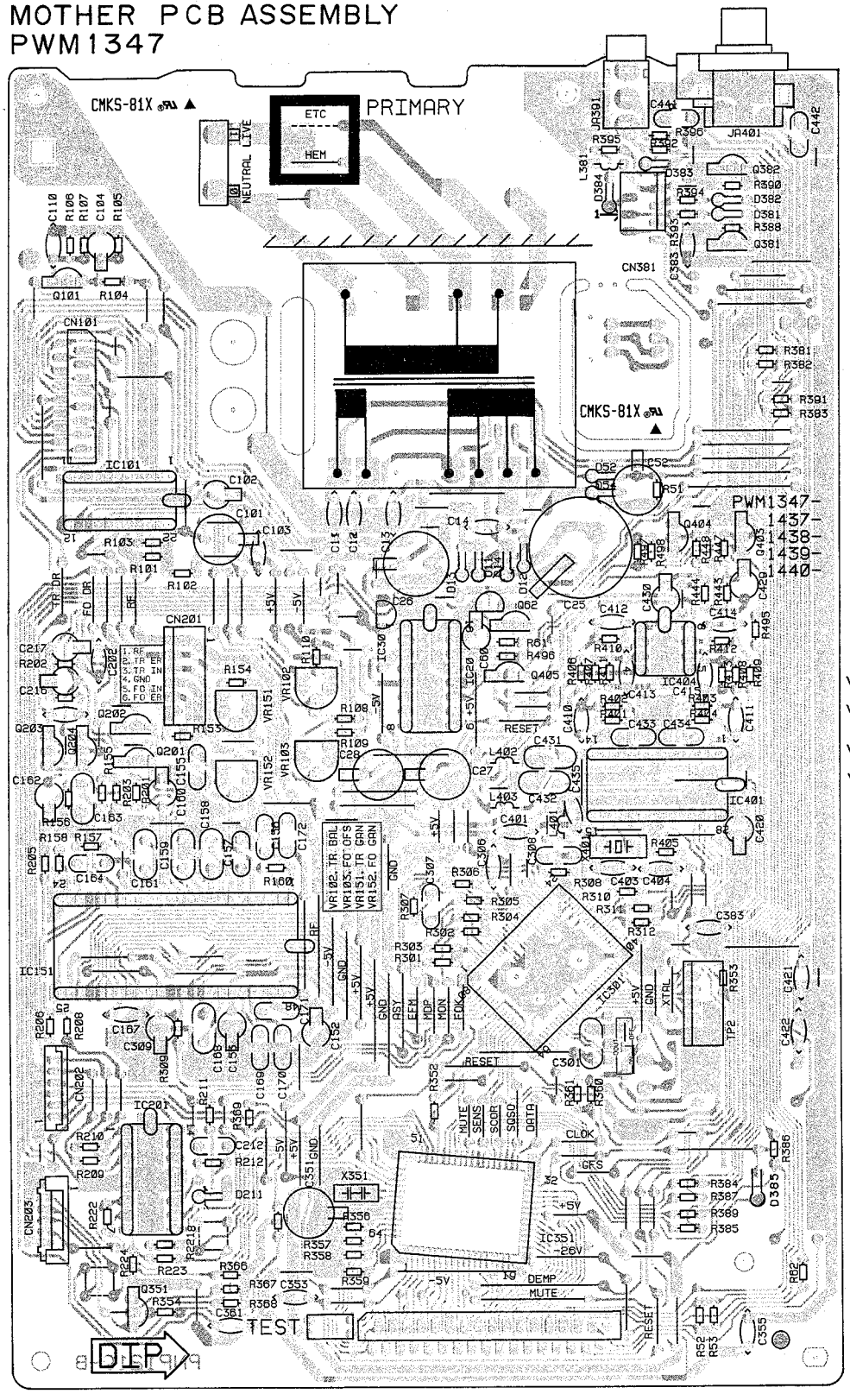
Note: The components of the mother board assembly are the same between the two types.

10.3 PACKING FOR PD–Z74T/HEMXJ AND HBXJ TYPES



10.4 P.C. BOARD PATTERNS

MOTHER PCB ASSEMBLY
PWM1347



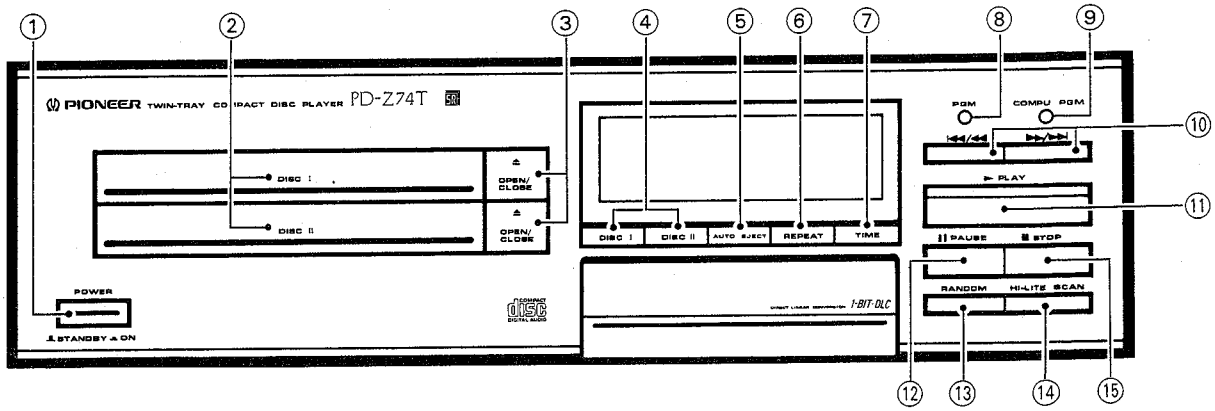
10.4 P.C. BOARD PATTERNS

This P.C.B. connection diagram is viewed from the foil side.

MOTHER PCB ASSEMBLY
PWM1347

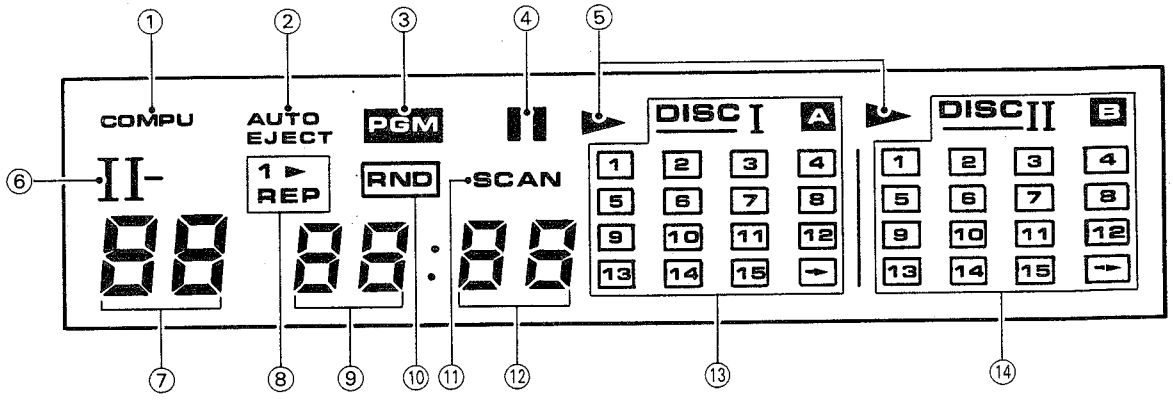
11. PANEL FACILITIES

PD-Z74T



FRONT PANEL

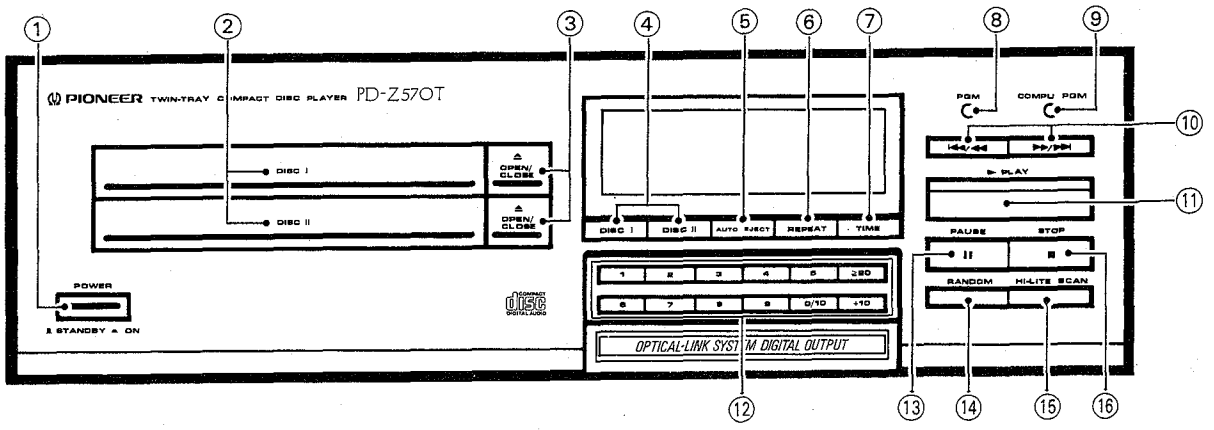
① Power switch (POWER STANDBY/ON)
② Disc trays (DISC I, DISC II)
③ OPEN/CLOSE buttons (I, II)
④ Disc select buttons (DISC I, DISC II)
⑤ AUTO EJECT button
⑥ REPEAT button
⑦ TIME button
⑧ Program button (PGM)
⑨ Computer allocated program editing button (COMPU PGM)
⑩ Track/Manual search buttons (⏮/◀◀, ▶▶/⏭)
⑪ PLAY button (▶)
⑫ PAUSE button (❚❚)
⑬ Random play button (RANDOM)
⑭ HI-LITE SCAN button
⑮ Stop/Clear button (STOP ■)



DISPLAY

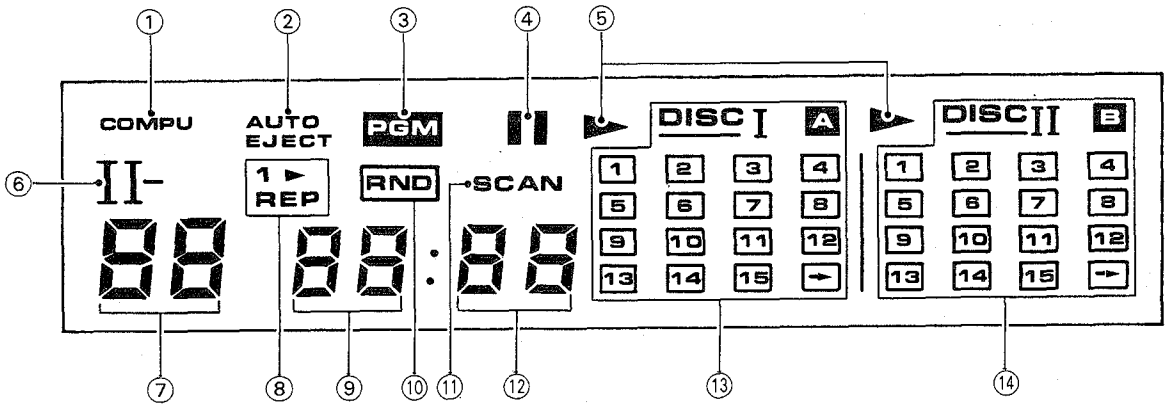
① Lights during use of computer allocated program editing.
② Lights during auto eject.
③ Lights during program input.
④ Lights during playback pause.
⑤ Lights during playback. (DISC I or DISC II)
⑥ Indicates disc number (I or II) during playback or search.
⑦ Indicates track number (01—99) during playback or search.
⑧ Lights during repeat playback. (During single-track repeat, the [1▶] indicator also lights).
⑨ Indicates the minutes digit of the track playing time and remaining time.
⑩ Lights during random playback.
⑪ Lights during HI-LITE scan on DISC I or DISC II.
⑫ Indicates the seconds digit of the track playing time and remaining time.
⑬ Indicates the track number on DISC I.
Also indicates the track numbers for editing on side A of a cassette tape.
⑭ Indicates the track number on DISC II.
Also indicates the track numbers for editing on side B of a cassette tape.

PD–Z570T



FRONT PANEL

① Power switch (POWER STANDBY/ON)
② Disc trays (DISC I, DISC II)
③ OPEN/CLOSE buttons (I, II)
④ Disc select buttons (DISC I, DISC II)
⑤ AUTO EJECT button
⑥ REPEAT button
⑦ TIME button
⑧ Program button (PGM)
⑨ Computer allocated program editing button (COMPU PGM)
⑩ Track/Manual search buttons (⏮/◀◀, ▶▶/⏭)
⑪ PLAY button (▶)
⑫ Track number buttons (1—0/10, +10, ≧20)
⑬ PAUSE button (❚❚)
⑭ Random play button (RANDOM)
⑮ HI-LITE SCAN button
⑯ Stop/Clear button (STOP ■)



DISPLAY

① Lights during use of Computer allocated program editing.
② Lights during auto eject.
③ Lights during program input.
④ Lights during playback pause.
⑤ Lights during playback. (DISC I or DISC II)
⑥ Indicates disc number (I or II) during playback or search.
⑦ Indicates track number (01—99) during playback or search.
⑧ Lights during repeat playback. (During single-track repeat, the [1▶] indicator also lights).
⑨ Indicates the minutes digit of the track playing time and remaining time.
⑩ Lights during random playback.
⑪ Lights during HI-LITE scan on DISC I or DISC II.
⑫ Indicates the seconds digit of the track playing time and remaining time.
⑬ Indicates the track number on DISC I.
Also indicates the track numbers for editing on side A of a cassette tape.
⑭ Indicates the track number on DISC II.
Also indicates the track numbers for editing on side B of a cassette tape.

12. SPECIFICATIONS

PD-Z74T

1. General

Type ..... Compact disc digital audio system
Power requirements
European models ..... AC 220V, 50/60Hz
U.K., Australian models ..... AC 240V, 50/60Hz
U.S., Canadian models ..... AC 120V, 60Hz
Other models ..... AC 110/120—127/220/240V (switchable), 50/60Hz
Power consumption 10W
Operating temperature ..... +5°C—+35°C (+41°F—+95°F)
Weight 3.4kg (7lb, 8oz)
External dimensions ..... 360(W) × 290(D) × 105(H)mm 14-3/16(W) × 11-13/32(D) × 4-1/8(H) in.

2. Audio section

Frequency response ..... 2Hz—20kHz
S/N ..... 100dB or more (EIAJ)
Dynamic range ..... 94dB or more (EIAJ)
Channel separation ..... 93dB or more (EIAJ)
Wow and flutter ..... Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Number of channels ..... 2 channels (stereo)

3. Output terminal

- Audio line output terminal
- Control output terminal

4. Functions

- Play
- Pause
- Track search
- Manual search
- Programmed playback
- Programmed repeat
- Pause program
- Computer allocated program editing
- Single track repeat
- Sequential disc all track repeat
- Relay playback
- Random relay play
- Auto eject play
- Auto eject random play
- Random play
- Random repeat
- Hi-lite scan
- Display of a particular track

5. Accessories

- Remote control cord 1
- Output cable 1
- Operating instructions 1

NOTE:
The specifications and design of this product are subject to change without notice, due to improvements.

PD-Z570T

1. General

Type ..... Compact disc digital audio system
Power requirements
European models ..... AC 220V, 50/60Hz
U.K., Australian models ..... AC 240V, 50/60Hz
U.S., Canadian models ..... AC 120V, 60Hz
Other models ..... AC 110/120—127/220/240V (switchable), 50/60Hz
Power consumption 10W
Operating temperature ..... +5°C—+35°C (+41°F—+95°F)
Weight 3.5kg (7lb, 12oz)
External dimensions ..... 360(W) × 285(D) × 121(H)mm 14-3/16(W) × 11-7/32(D) × 4-25/32(H) in.

2. Output terminal

- Optical digital output terminal

3. Functions

- Play
- Pause
- Track search
- Manual search
- Programmed playback
- Programmed repeat
- Pause program
- Computer allocated program editing
- Single track repeat
- Sequential disc all track repeat
- Relay playback
- Random relay play
- Auto eject play
- Auto eject random play
- Random play
- Random repeat
- HI-LITE scan
- Display of a particular track

4. Accessories

- Optical fiber cable 1
- Operating instructions 1

NOTE:
The specifications and design of this product are subject to change without notice, due to improvements.

XP 361

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PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
ARP2321

TWIN–TRAY COMPACT DISC PLAYER

PD-Z570T HEMXJ

- **Refer to the service manual ARP2131 for PD–Z74T and PD–Z570T.**
- **This manual is applicable to PD–Z570T/HEMXJ type.**
- **As for circuit diagram and PCB's parts list, refer to page 16 to 18 and page 28 to 29 respectively in the service manual ARP2131 for PD–Z74T and PD–Z570T.**

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
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PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 9120 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 319, Australia TEL: [03] 580-9911
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SG AUG. 1991 Printed in Japan

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CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

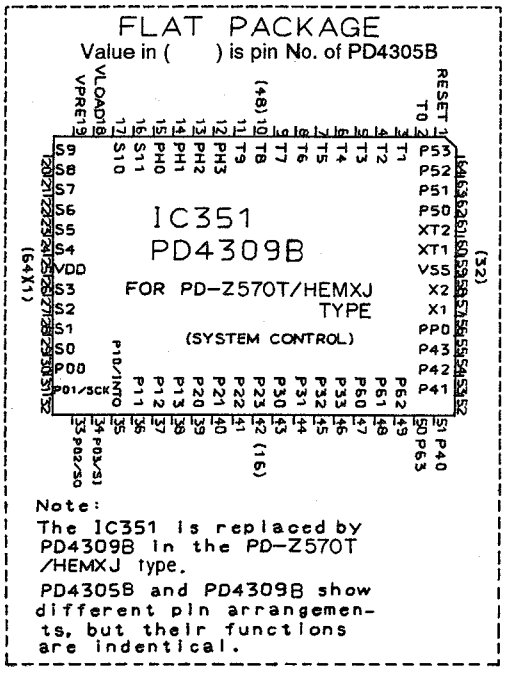
The PD–Z570T/HEMXJ type is the same as the PD–Z570T/HEM type with the exception of the following section.

Mark	Symbol & Description	Part No.		Remarks
		PD–Z570T/ HEM type	PD–Z570T/ HEMXJ type	
⊙	Packing case Mother board assembly	PHG1579 PWM1345	PHG1717 PWM1437	

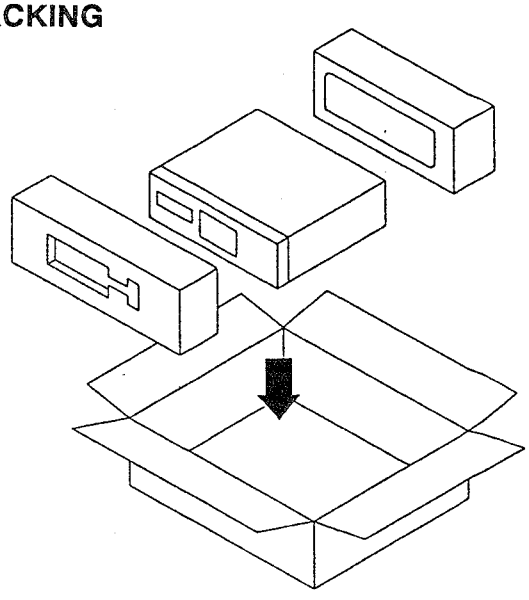
MOTHER BOARD ASSEMBLY (PWM1437)

The mother board assembly (PWM1437) is the same as the mother board assembly (PWM1345) with the exception of the following section.

Mark	Symbol & Description	Part No.		Remarks
		PWM1345	PWM1437	
	IC351	PD4305B	PD4309B	

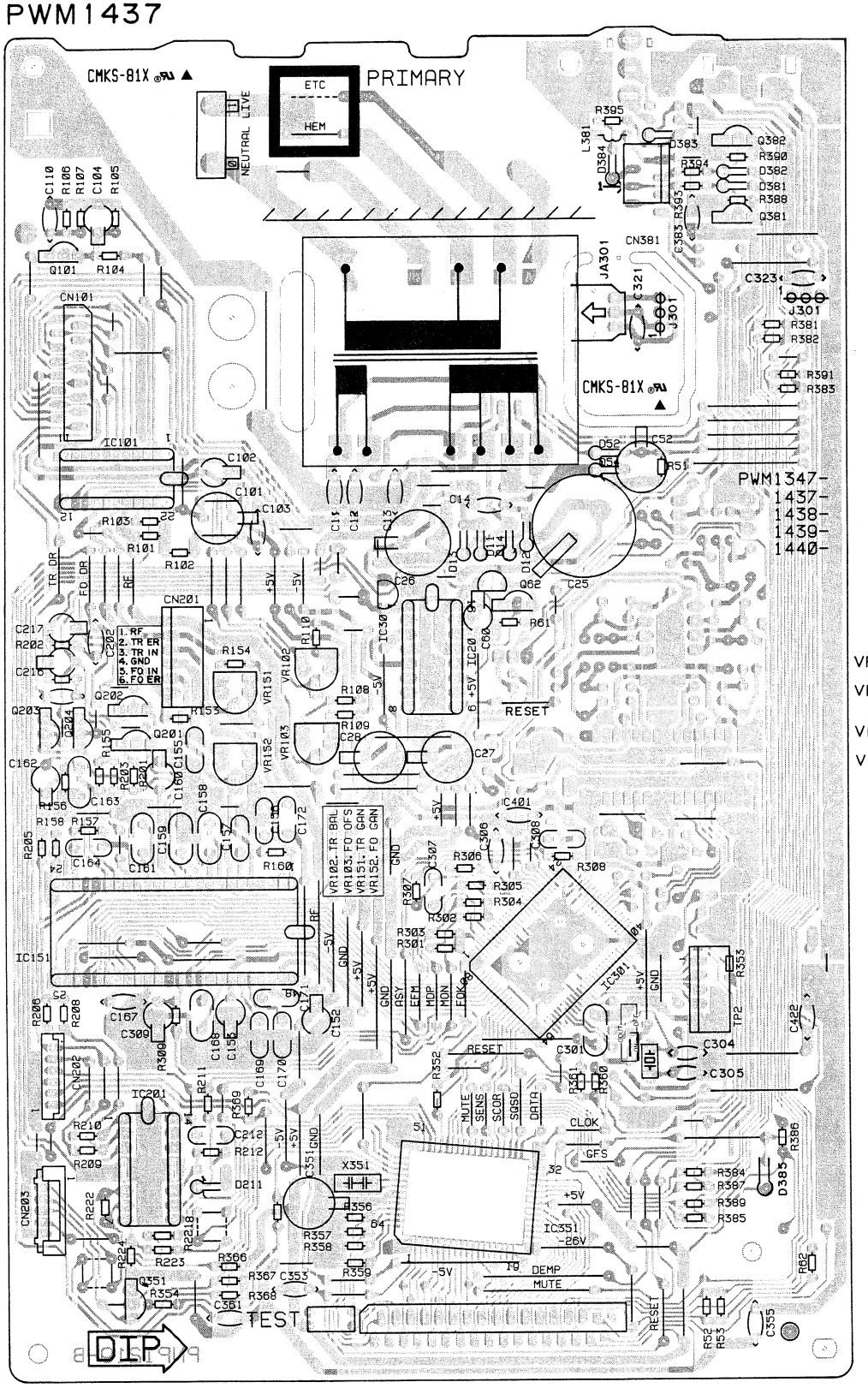

FLAT PACKAGE
Value in ( ) is pin No. of PD4305B
IC351
PD4309B
FOR PD-Z570T/HEMXJ TYPE
(SYSTEM CONTROL)
Note:
The IC351 is replaced by PD4309B in the PD-Z570T /HEMXJ type.
PD4305B and PD4309B show different pin arrangements, but their functions are indentical.

PACKING



● P.C. BOARD PATTERN
(MOTHER BOARD ASSEMBLY FOR PD–Z570T/HEMXJ TYPE)

MOTHER PCB ASSEMBLY
PWM1437



Q382
Q381
Q101
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IC30 Q62
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VR151
Q202
VR103 Q203 Q204
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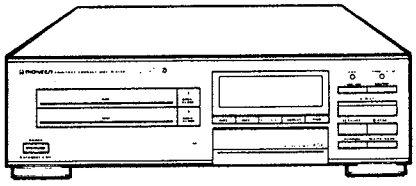
Service Manual



SERVICE GUIDE
ORDER NO.
ARP2144

TWIN–TRAY COMPACT DISC PLAYER

PD-Z74T

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DISASSEMBLY AND REASSEMBLY PROCEDURE OF TWIN MECHANISM

1. DISASSEMBLY

1.1 REMOVAL OF TRAY I

(1) Set the tray I to the OPEN position by pressing the OPEN/CLOSE button.

Note: When openning the tray I manually, insert a finger from the groove and rotate the idler gear in clockwise direction, shown in Fig. 1–1.

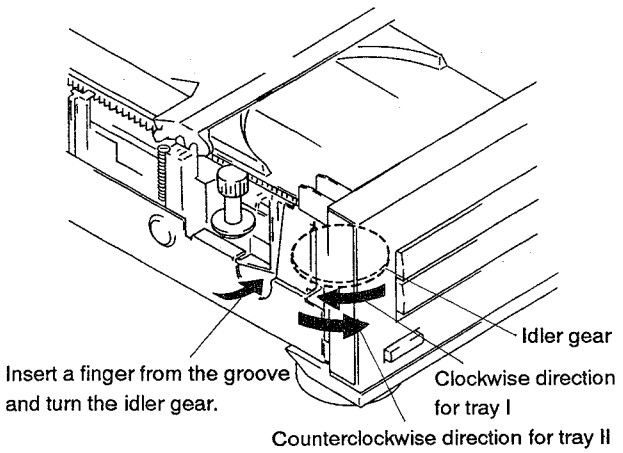
Idler gear
Insert a finger from the groove and turn the idler gear.
Clockwise direction for tray I
Counterclockwise direction for tray II

Fig. 1–1

(2) As shown in Fig. 1–2, insert a screw driver to the left slit of the tray I and pull out the tray in the direction of the arrow B, while the screw driver keeping to press in the direction of the arrow A.

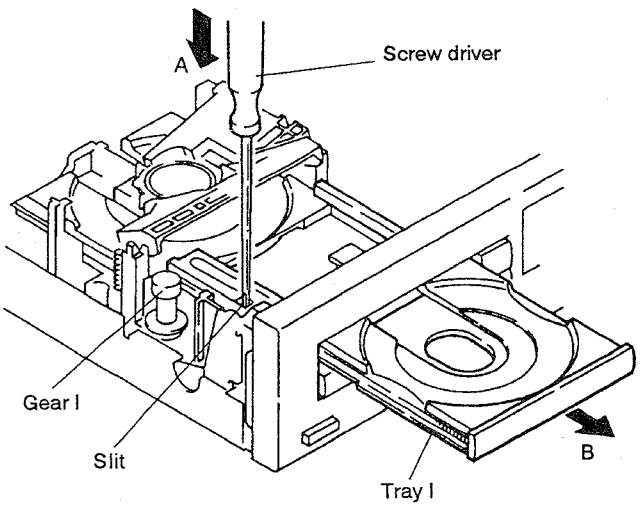

Fig. 1–2

1.2 REMOVAL OF TRAY II

(1) Set the tray II to the OPEN position by pressing the OPEN/CLOSE button.

Note: When openning the tray II manually, rotate the idler gear in the counterclockwise direction, shown in Fig. 1–1.

(2) As shown in Fig. 1–3, insert a screw driver to the right slit of the tray II and pull out the tray in the direction of the arrow B, while the screw driver keeping to press in the direction of the arrow A.

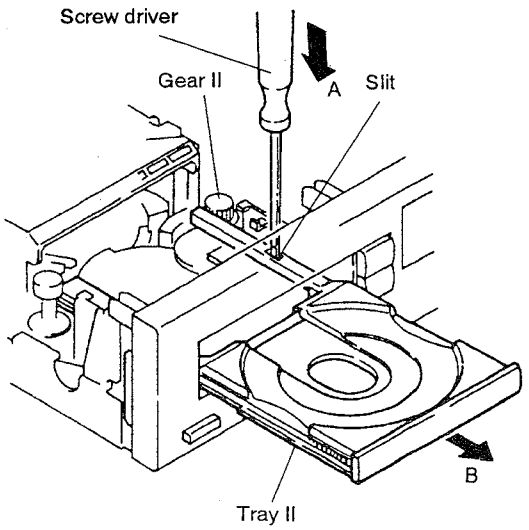

Fig. 1–3

1.3 REMOVAL OF CLAMPER ARM U AND B

(1) As shown in Fig. 1–4, rotate the idler gear so that the clamper assembly not to be clamped on the disc table. Next, take out the clamp sprig and the screw Ⓐ, and remove the clamper arm U and B.

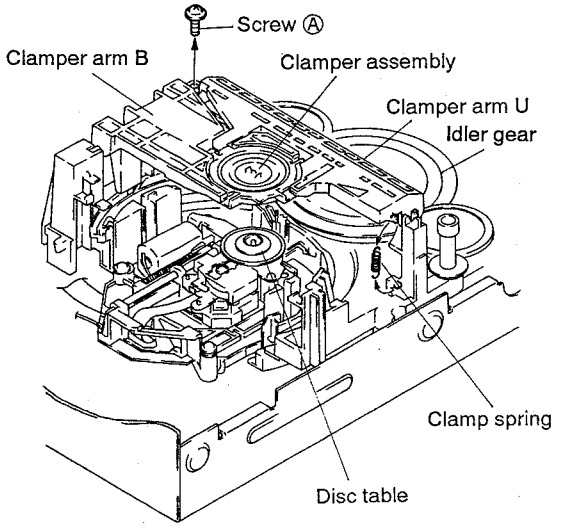

Fig. 1–4

1.4 REMOVAL OF SERVO MECHANISM ASSEMBLY

(1) Remove the tray I. (Refer to 1.1, REMOVAL OF TRAY I)
(2) Remove the tray II. (Refer to 1.2, REMOVAL OF TRAY II)
(3) Remove the clamper arm U and B. (Refer to 1.3, REMOVAL OF CLAMPER ARM U AND B)
(4) Remove four screws holding the servo mechanism assembly.

Note: As shown in Fig. 1–5, lead wires from the servo mechanism assembly are fixed by two hooks and a binder on the back of the twin tray mechanism section.

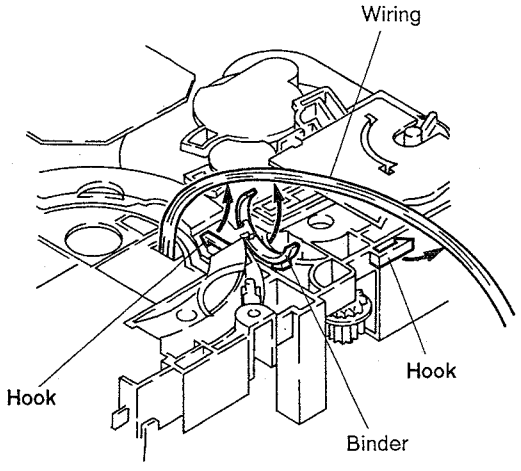

Fig. 1–5

1.5 REMOVAL OF LOADING BELT AND LOADING MOTOR

(1) Remove the tray I. (Refer to 1.1, REMOVAL OF TRAY I)
(2) Set the tray II to the OPEN position. (Refer to 1.2, REMOVAL OF TRAY II (1))
(3) Remove the belt and two screws Ⓑ, shown in Fig. 1–6.

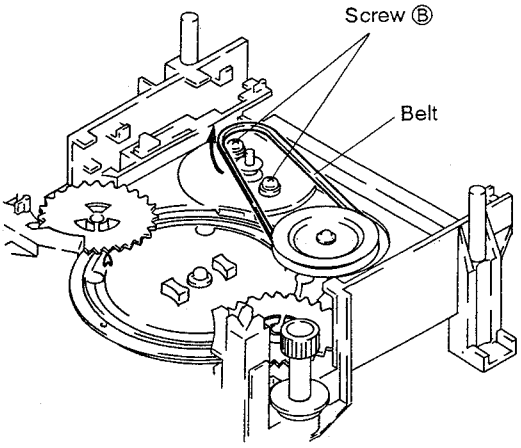

Fig. 1–6

(4) Set the tray II to the Close position.
(5) Remove screws holding the twin tray mechanism, and take out the twin tray mechanism from the body.
(6) Turn over the twin tray mechanism to set the position as shown in Fig. 1–7.
(7) Remove a screw Ⓒ holding the mechanism PCB assembly.
(8) Hold the A section of the mechanism PCB assembly and lift it up to the direction of the arrow, and remove the loading motor accompanied with the mechanism PCB assembly.

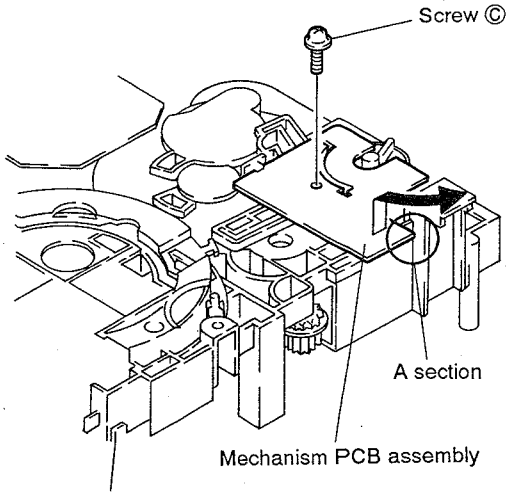

Fig. 1–7

2. REASSEMBLY

2.1 ASSEMBLY OF CLAMPER CAM AND FLOATING BASE

(1) As shown in Fig. 2–1, adjust the notches (3 points) in the clamper cam to the claws (3 points) of the loading base, and set the clamper cam to the position as the arrow shows.

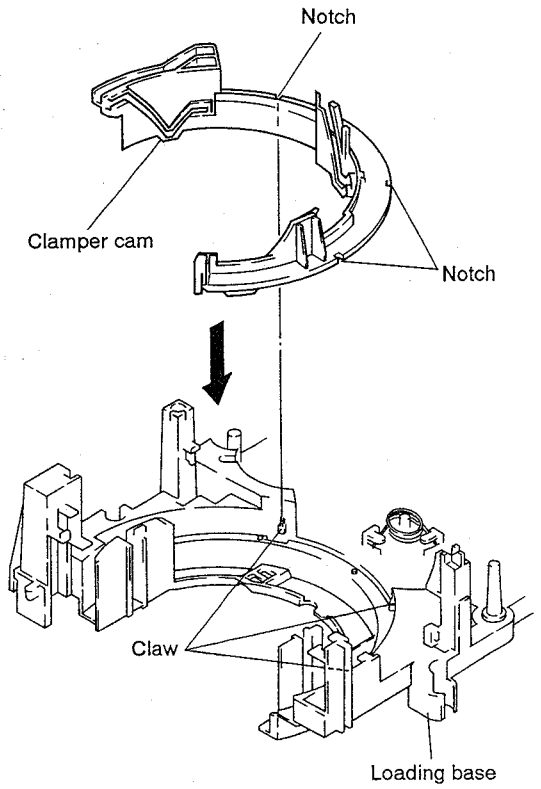

Fig. 2–1

(2) After adjusting the notches in the clamper cam to the claws (3 points) showing in Fig. 2–1, place the protrusions of the floating base on the grooves (2 points) of loading base as the arrow shows in Fig. 2–2.

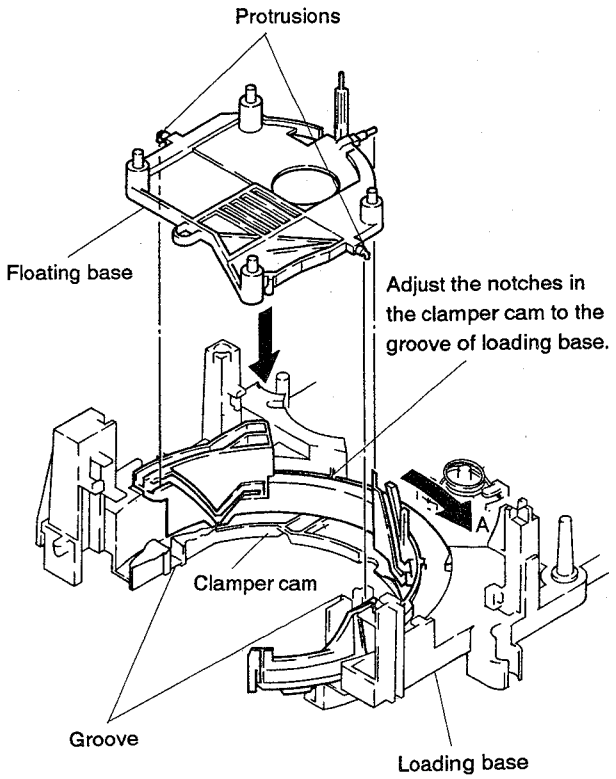

Fig. 2–2

(3) Rotate the clamper cam in the direction of the arrow A, and stop the rotation when the floating base reaches to the lowest position.

Note: Keep the floating base to the lowest position till the assembling of the main cam, follow gear, gear I, gear II, clamper arm U and B is completed.

2.2 ASSEMBLY OF MAIN CAM, FOLLOW GEAR, GEAR I, GEAR II AND GEAR PULLEY

(1) As shown in Fig. 2–3, attach the main cam, trying to adjust the main cam hole A to the clamper cam protrusion. Next, hold it with screw Ⓓ.

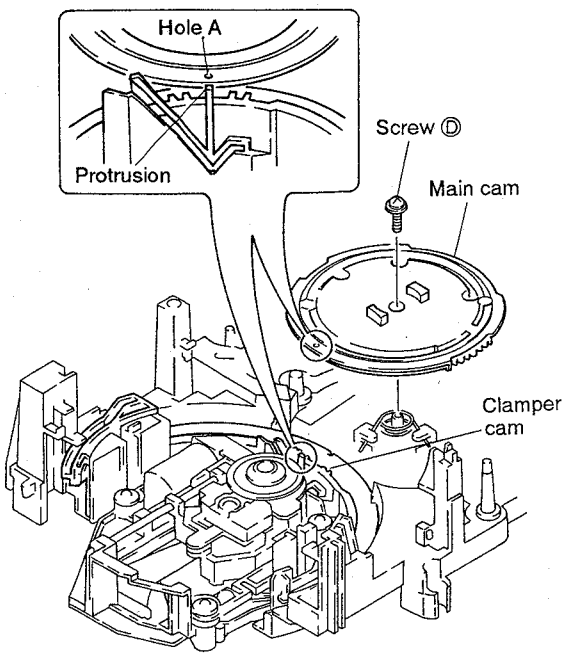

Fig. 2–3

(2) As shown in Fig. 2–4, after adjusting ♡ marks (2 points) on the main cam to the same marks on the two follow gears, insert them into the section A and B respectively.

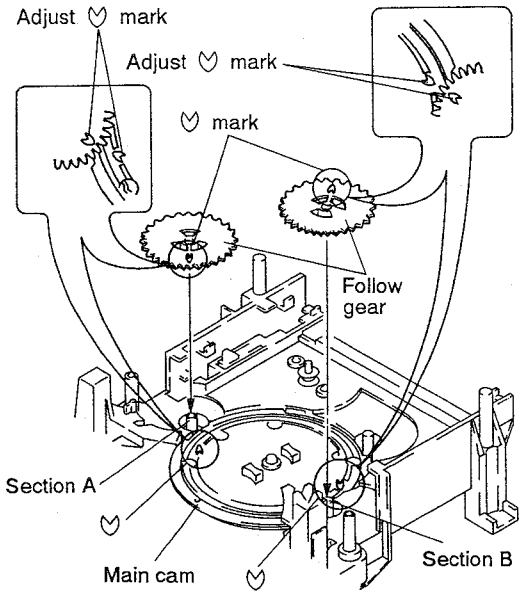

Fig. 2–4

(3) As shown in Fig. 2–5, adjust ⌂ mark on the gear I and the gear II to the hole ⌂ on follow gears, insert to positions shown in Fig., and hold them with two screws Ⓔ respectively.

(4) Insert the gear pulley to the position shown in Fig., and hold with the screw Ⓕ.

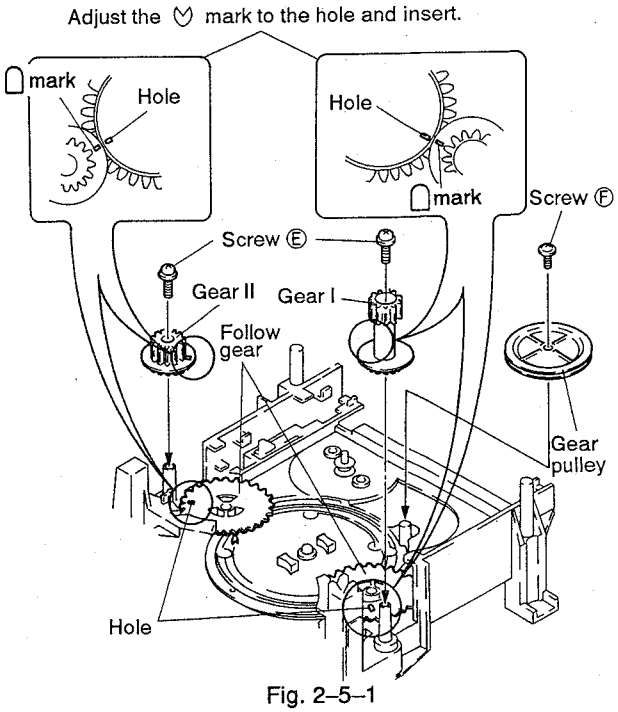

Fig. 2–5–1

(5) Finally, each gear position should be as follows.

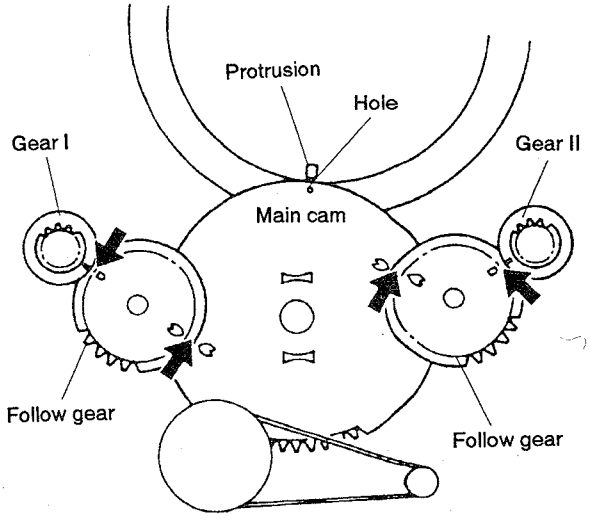

Fig. 2–5–2

2.3 ASSEMBLY OF CLAMPER ARM B, CLAMPER ARM U AND CLAMPER ASSEMBLY

(1) As shown in Fig. 2–6, insert the protrusion A of the clamper arm B into the groove of the loading base, and insert the protrusion C into the groove on the loading base, while the protrusion B being inserted into the groove on the clamper cam.

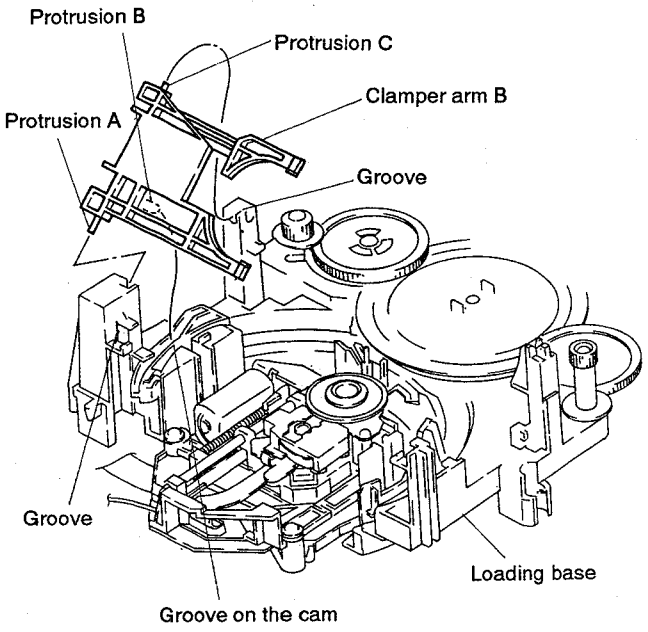

Fig. 2–6

(2) As shown in Fig. 2–7, attach the clamper assembly to the clamper arm B so that the protrusion D of the clamper assembly may turn to the position as Fig. shows.

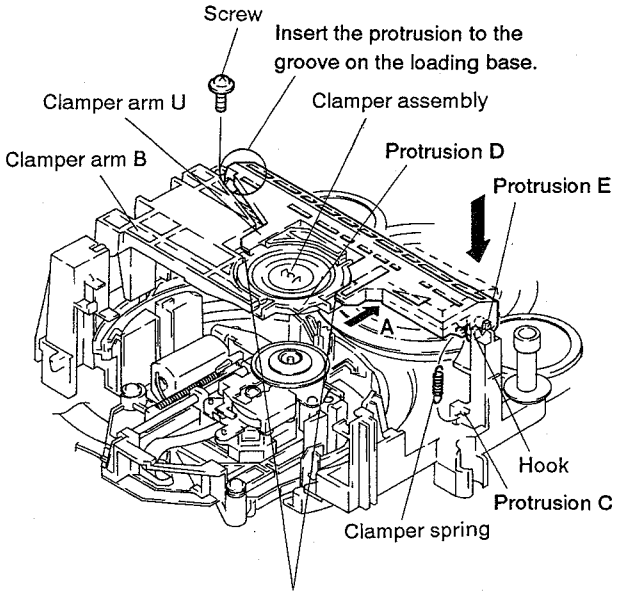

Fig. 2–7

(3) As shown in Fig. 2–7, insert the protrusion of the clamper arm U to the groove on the clamper assembly, and slide in the direction of the arrow A. Next, insert the protrusion of the clamper arm U to the groove on the loading base, while the protrusion E being pushed into the hook of the loading base.

2.4 ASSEMBLY OF LOADING MOTOR

(1) Press down the motor pulley toward the upper surface of the loading motor, keeping the space of 3 mm between the motor pulley and the upper surface of the loading motor.

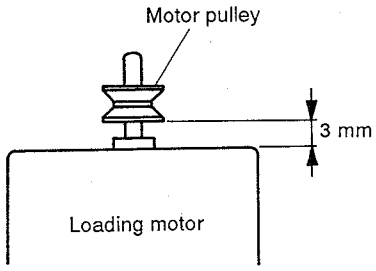

Fig. 2–8

(2) Solder the terminals of the loading motor to the mechanism PCB assembly. Since the loading motor has polarity, the positional relation between the label of the motor and the mechanism PCB assembly is shown in Fig. 2–9.

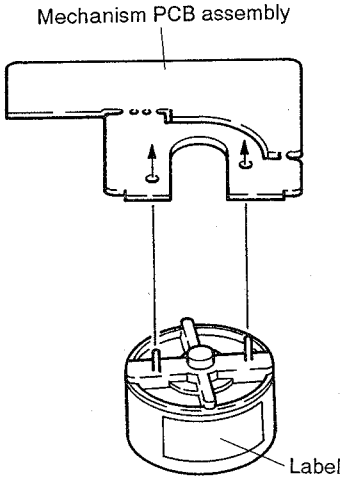

Fig. 2–9

(3) As shown in Fig. 2–10, after turning over the loading base, insert section A into the section B as the arrow shows, and fix with the screw Ⓖ.

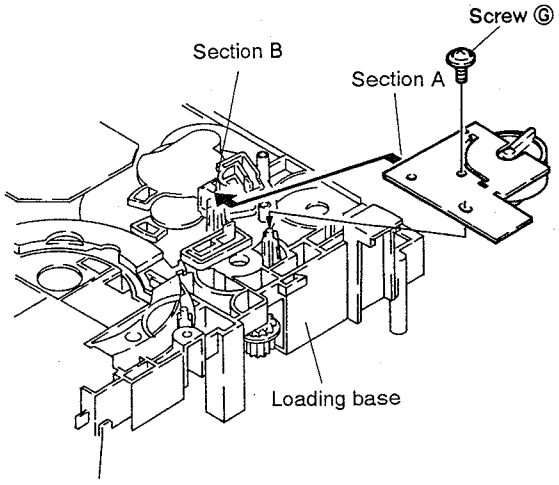

Fig. 2–10

(4) Turn over the loading base once again, and tighten the loading motor with two screws Ⓑ and set the belt as shown in Fig. 2–11.

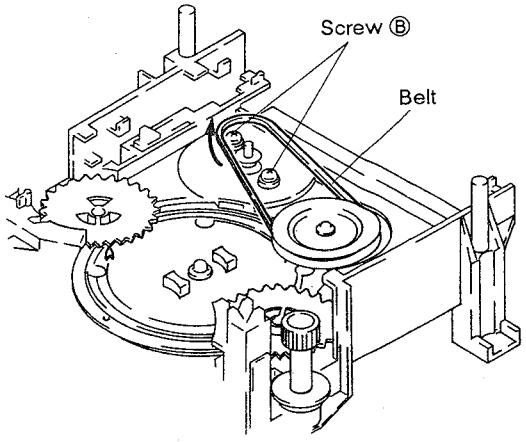

Fig. 2–11

2.5 ASSEMBLY TRAY I AND TRAY II

(1) As shown in Fig. 2–12, attach the lock lever and the lever spring to the sub tray (the two same forms), which must be placed to the left hand of the sub tray, if the sub tray is attached with the tray I, and which must be placed to the right hand of it, if it is attached with the tray II, looking from the front of the sub tray.

Note: Two lock levers are the same forms.

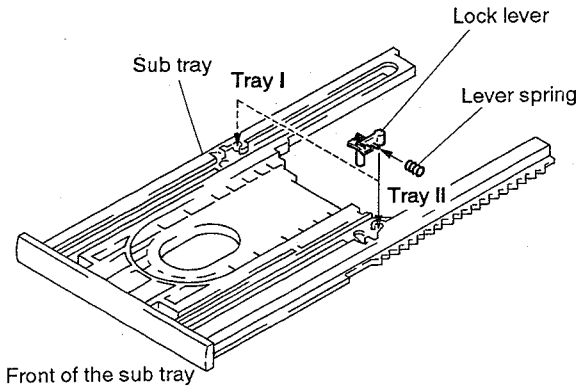

Fig. 2–12

(2) As shown in Fig. 2–13, attach the tray I or II to the sub tray by the hook applied to the section A. At that time note that the tray I has the gear on the left hand, and the tray II has the gear on the right hand. When attaching respectively, make sure the position where the lock lever attached.

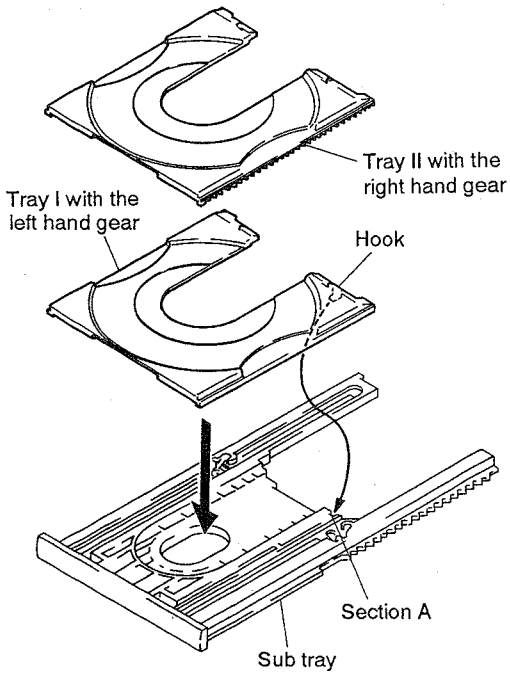

Fig. 2–13

(3) As shown in Fig. 2–14, turn over the tray, and put three screws Ⓗ on it.

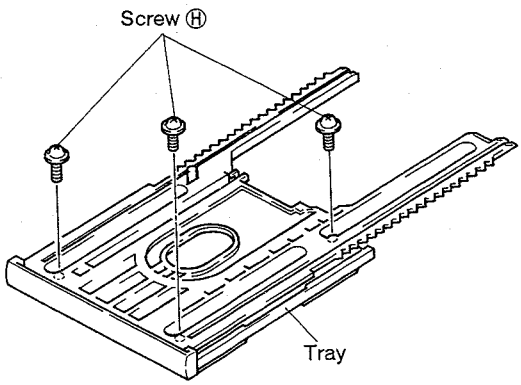

Fig. 2–14

2.6 ATTACHMENT OF TRAY II

(1) Press the OPEN/CLOSE button to make the tray I is in clamp condition, and the tray II is in open condition.

Note 1: When opening the tray II manually, insert a finger into the groove shown in Fig. 2–15, and fully rotate the idler gear counterclockwise. (As for the idler gear, refer to Fig. 1–1)

Note 2: Tray I should be attached after tray II's attachment has been completed.

(2) As shown in Fig. 2–15, adjust the □ mark on the gear II to the first tooth of the tray II, then push in the tray II slowly.

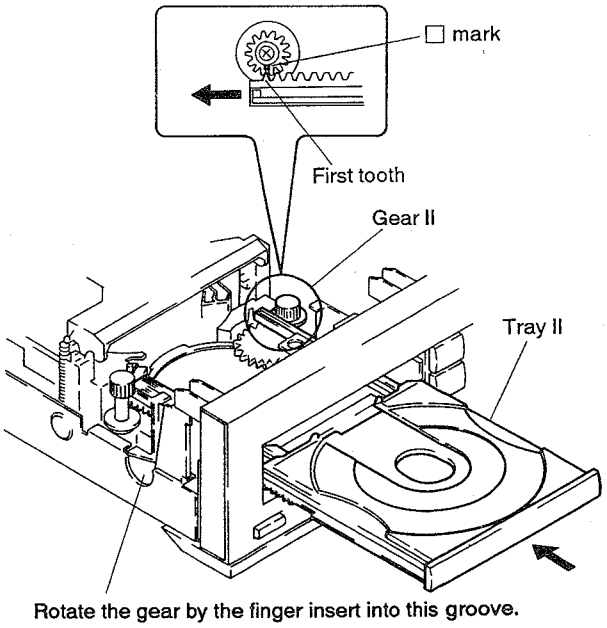

Fig. 2–15

2.7 ATTACHMENT OF TRAY I

(1) Press the OPEN/CLOSE button to make the disc II is in clamp condition, and the tray I is in open condition.

Note: When opening the tray I manually, insert a finger into the groove shown in Fig. 2–15, and rotate the idler gear clockwise, and tray II is clamped.
Further, rotate the idler gear, the pin pressing the switch appears at B position.When the pin moves to A position, stop the gear rotation. The gear I reaches to a position shown in the figure. At this position, attach the tray I.

(2) As shown in Fig. 2–16, adjust the first tooth of the tray I to the clogged part of the gear I, then push in the tray I slowly.

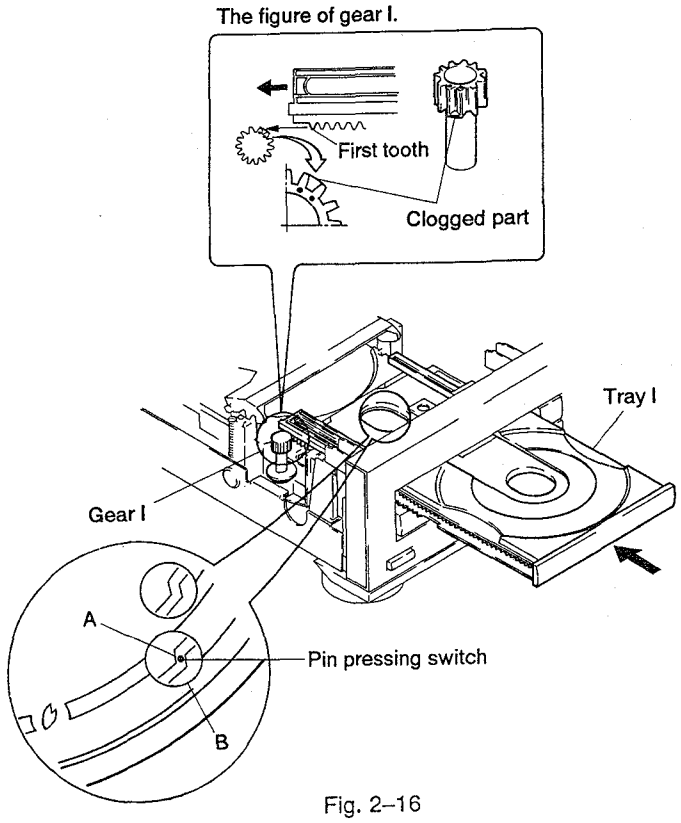

Fig. 2–16

2.8 STYLING

(1) Bend the wires as shown in Fig. 2–17.

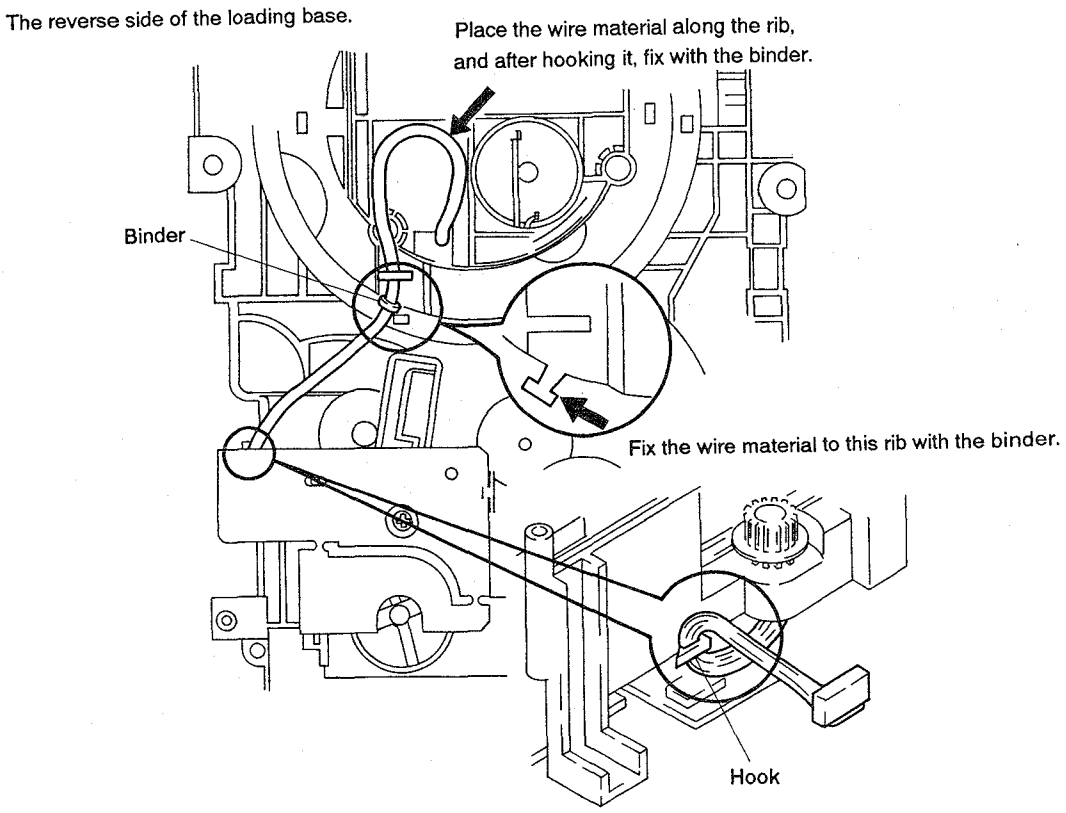
The reverse side of the loading base.
Place the wire material along the rib, and after hooking it, fix with the binder.
Binder
Fix the wire material to this rib with the binder.
Hook

Fig. 2–17

3. OPERATION OUTLINE

3.1 CHARACTERISTICS

The twin-tray mechanism of this unit is characterized by two basic features.
The first one is that both trays are driven by only one loading motor like in conventional single-tray system. This is a continuation of the design thought underlying the last generation twin-tray mechanism.
The second feature is the sandwiched tray design together with the utilization of a vertically moving servo mechanism for clamping, and horizontally arranged parts, resulting in a simplified construction and reducing the depth and width of the mechanism. As a result, the dimensions of the tray mechanism are almost the same size as for conventional single-tray system.
In addition, the mechanism is suited for mini-sized (260 mm width) products.

3.2 STRUCTURE OF THE TRAY SECTION

The tray section consists of a tray and a sub tray, as shown in Fig. 3-1. The tray slides in the sub tray grooves and is secured by three screws.
The switching between tray and sub tray operation is performed via a lock lever mounted on the sub tray.

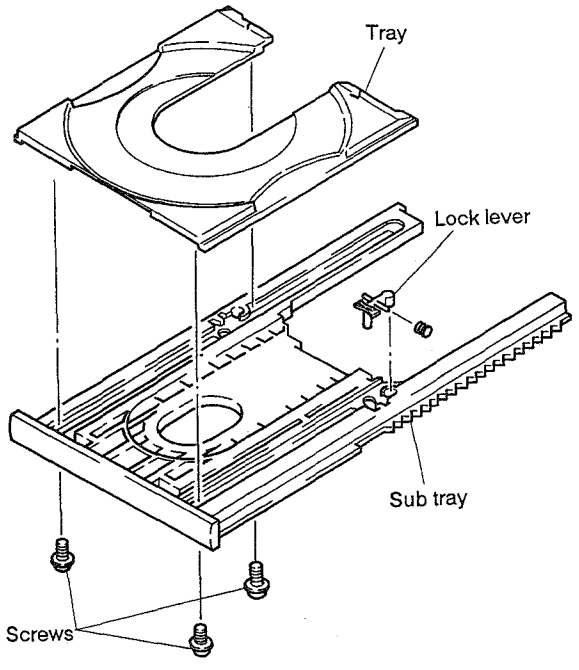

Fig. 3-1

As shown in Fig. 3-2, while the tray is opening or closing, the lock lever is held in the guide rib notch portion of the sub tray by the force of the lever spring, so that tray and sub tray move as one unit.

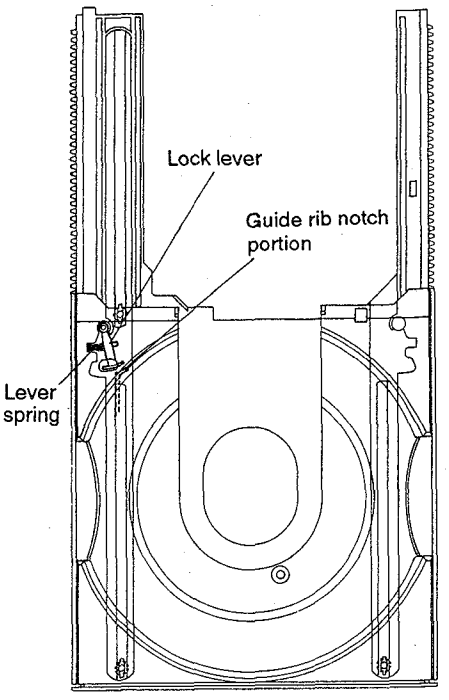

Fig. 3-2

When the tray is closed, the lock lever is disengaged from the guide rib notch of the sub tray by way of the guide groove in the loading base, and the interlocking between tray and sub tray is released.

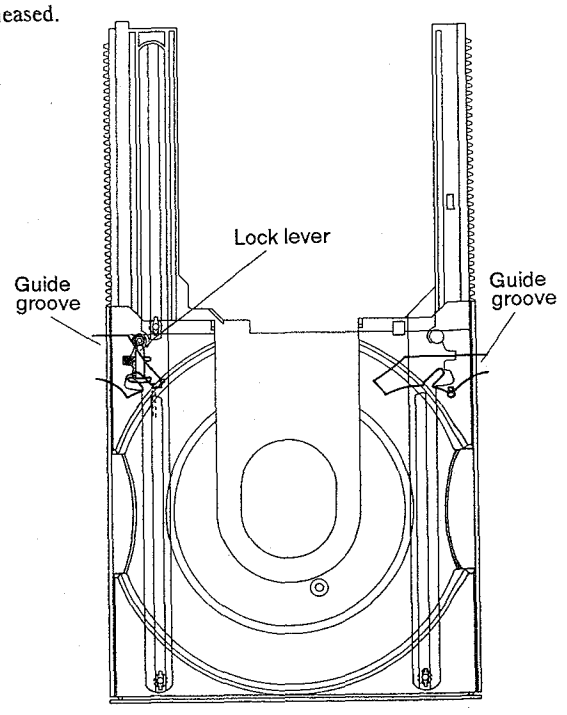

Fig. 3-3

When CHANGE or PLAY button is depressed, only the tray moves on the sub tray, as shown in Fig. 3–4. The driving gear for tray I is located on the left side of the tray and the lock lever is mounted on the left side of the sub tray. The driving gear and the lock lever for tray II are located on the right side.

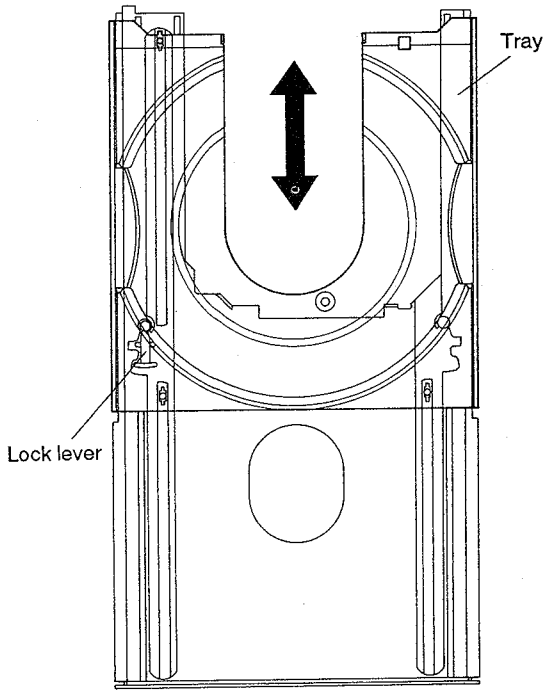

Fig. 3–4

3.3 POWER TRANSMISSION FROM THE LOADING MOTOR

As shown in Fig. 3–5, the rotation of the loading motor is transmitted to the main gear via a rubber belt, gear pulley, and idler gear.
The follow gears located on both side of the main gear are synchronized with the rotation of the main gear and rotate gear I and gear II respectively. Gears I and II drive the two trays.

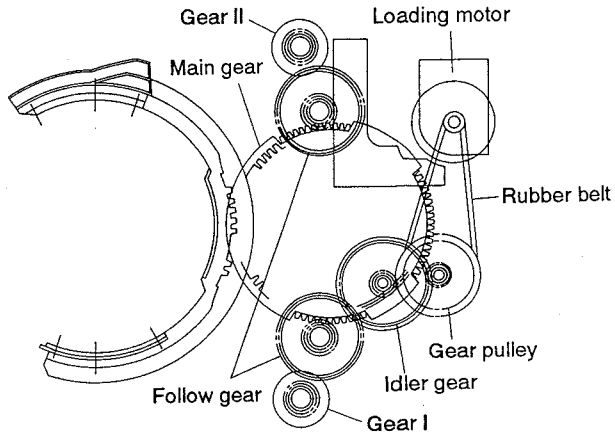

Fig. 3–5

As shown in Fig. 3–6, the drive power of the tray is transmitted by gears I and II to the gear section on the side of the sub tray and the tray. When the OPEN button is depressed, only the sub tray side is engaged, changing over to the tray side half–way between tray OPEN position and tray CLOSE position and then driving only the tray side to perform operation switching by the lock lever.

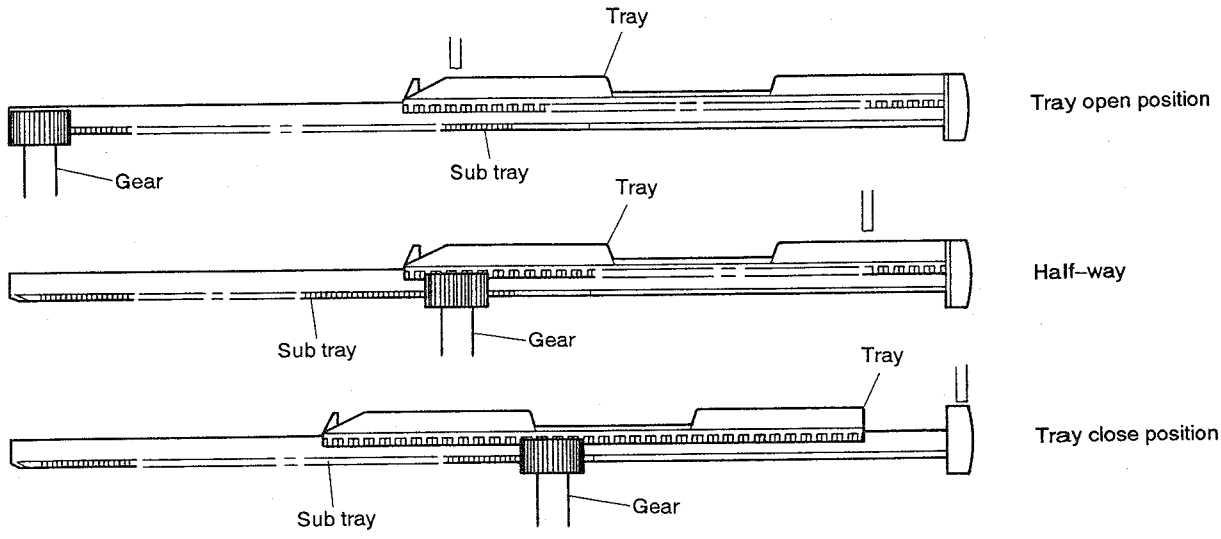

Fig. 3–6

The clamp cam, as shown in Fig. 3–7, rotates in synchronization with the main cam rotation to move the float base vertically. The cam groove of the clamp cam drives clamper arm B which, together with clamper arm U and the clamper holder, moves the clamper assembly up and down. (Refer to Fig. 1–4)

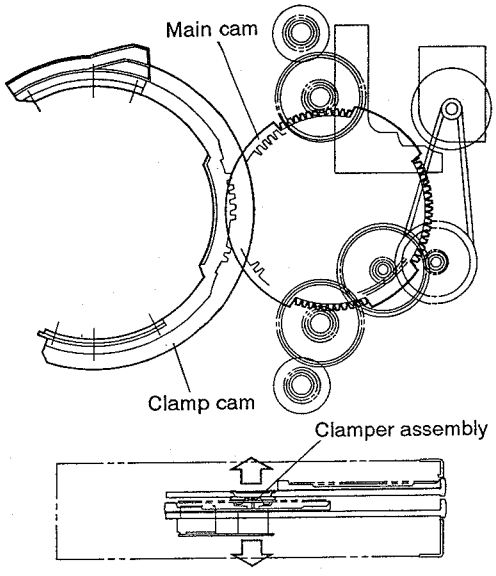

Fig. 3–7

3.4 TRAY POSITION DETECTION

The mechanism for tray position detection is shown in Fig. 3–8. The tray position is detected by the tips of three plastic springs, which are located on the loading base to follow the change of diameter in two grooves on the rear side of the main cam, and the ON/OFF condition of three switches located on the mechanism board.

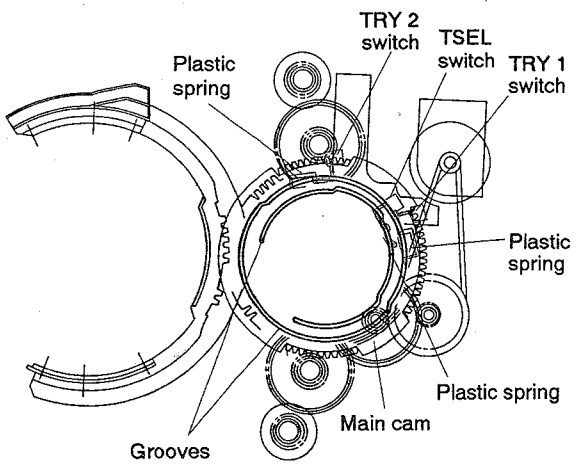

Fig. 3–8

3.5 MAIN CAM OPERATION

The main cam performs switching between operations.

(1) OPEN/CLOSE Operation

The two follow gears are located on the left and the right side of the main cam respectively. The left follow gear drives tray I via gear I and the right follow gear drives tray II via gear II.

As shown in Fig. 3–9, when tray I is in OPEN position, the left follow gear is engaged with the main cam gear. The non–toothed sections of the right follow gear and the main cam face each other, and the follow gear does not rotate. Therefore, when the motor rotates to tray I CLOSE direction (main cam rotates counterclockwise), only the left follow gear is driven to tray I to CLOSE direction. At this time, tray II is in the PLAY position.

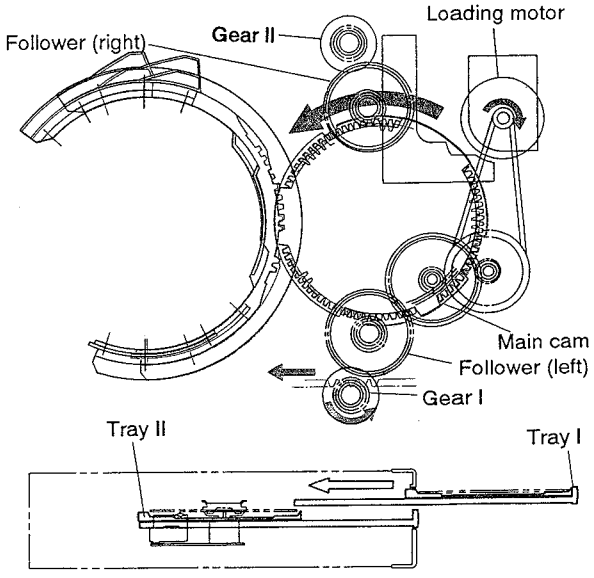

Fig. 3–9

		TRAY1	TRAY2	TRY1 switch	TSEL switch	TRY2 switch	Remarks
MECHANISM POSITION	①	OPEN	PLAY	L	H	L	When tray 2 is in play position, indicates that tray 1 has arrived in open position from close position.
	②	OPEN/ CLOSE	PLAY	H	H	L	When tray 2 is in play position, indicates that tray 1 is between close position and open position.
	③	CLOSE	PLAY	H	L	L	When tray 2 is in play position, indicates that tray 1 is at close position.
	④	CHANGE	CHANGE	H	L	H	When there is transition from ④ to ⑤, indicates that there is movement in progress with tray 1 to play position and tray 2 to close position.
	⑤	CHANGE	CHANGE	H	H	H	When there is transition from ⑤ to ④, indicates that there is movement in progress with tray 1 to close position and tray 2 to play position.
	⑥	PLAY	CLOSE	L	H	H	Indicates that tray 1 is in play position and tray 2 in close position.
	⑦	PLAY	OPEN/ CLOSE	L	L	H	When tray 1 is in play position, indicates that tray 2 is between close position and open position.
	⑧	PLAY	OPEN	L	L	L	When tray 1 is in play position, indicates that tray 2 has arrived in open position.

As shown in Fig. 3–10, when tray I is in CLOSE position, the non–toothed sections of the main cam and the left follow gear face each other, so that the follow gear does not rotate. At this time, the right follow gear is still positioned at the non–toothed section of the main cam so that tray II remains in PLAY position. OPEN/CLOSE operation of tray II is performed by reversing the above operation.

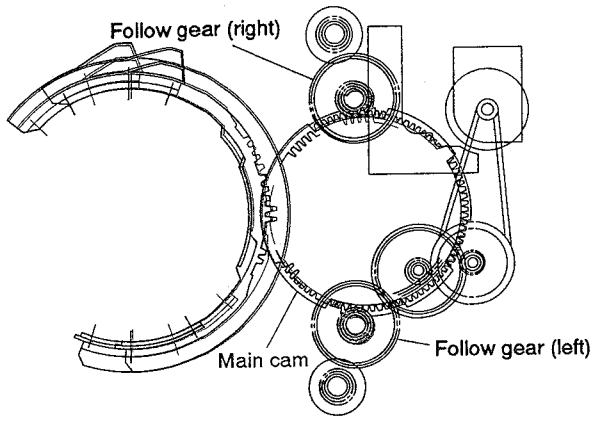

Fig. 3–10

(2) DISC Change Operation

As shown in Fig. 3–11, when tray I is in CLOSE position and tray II is in PLAY position, the follow gears (right and left) do not rotate as described above. At this time, the single tooth of the main cam and the 2–tooth of the clamp cam will be engaged and the clamp cam starts to rotate.

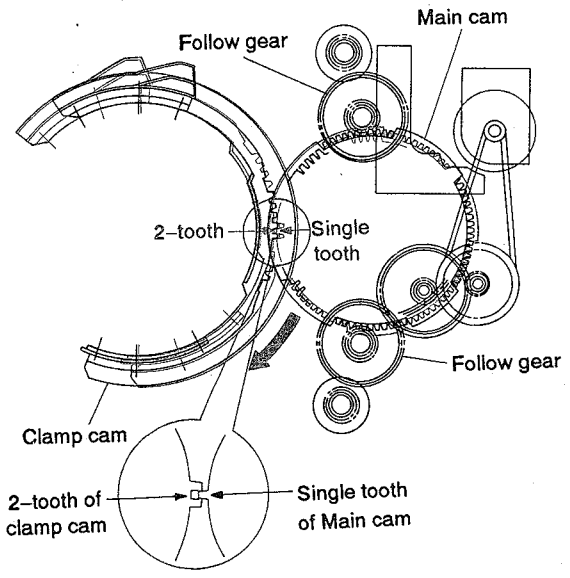

Fig. 3–11

When the main cam rotates counterclockwise as shown in Fig. 3–12, the clamp cam also rotates synchronously. The float base supported by the loading base guide moves down along the three V–shaped cams of the clamp cam. At the same time, the clamper arm moves along the groove on the right side of the clamp cam to raise the clamper assembly. By this operation the DISC clamp is released.

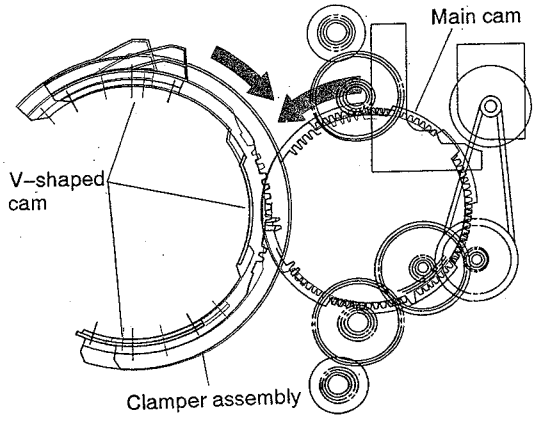

Fig. 3–12

When the main cam rotates further as shown in Fig. 3–13, the float base moves to the valley of the V–shaped cam and the gear section of the main cam and the follow gears are engaged. The follow gears (right and left) simultaneously rotate in clockwise direction. Driven by the follow gears, gears I and II rotate and simultaneously move tray I from the CLOSE position to the PLAY position and tray II from the PLAY position to the CLOSE position.

By this operation the DISC is changed. At this time, the non–toothed sections of the clamp cam and the main cam face each other so that the cams do not rotate.

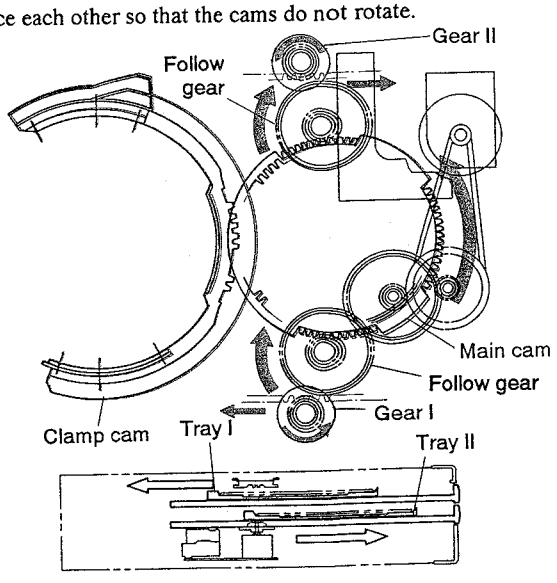

Fig. 3–13

As shown in Fig. 3–14, the second level gear of the main cam and the clamp cam gear engage just before the movements of tray I and tray II are completed, and the clamp cam starts to rotate again. The right and left follow gears face the non–toothed sections of the main cam, and at the same time the rotation stops.

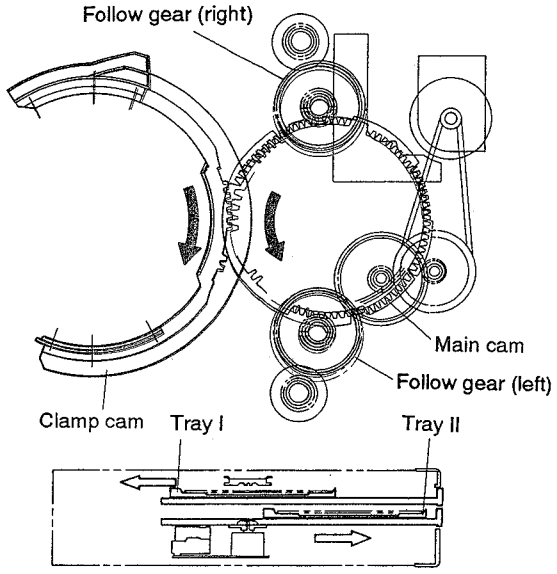

Fig. 3–14